

DAC-63112

**STUDY OF DUST DEVILS AS RELATED TO
THE MARTIAN YELLOW CLOUDS**

**Volume II-Basic Data
(Appendix to Final Report)**

FACILITY FORM 102

N70-15692	
(ACCESSION NUMBER)	(THRU)
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(PAGES)	(CODE)
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MCDONNELL DOUGLAS ASTRONAUTICS COMPANY

MCDONNELL DOUGLAS

CORPORATION

JANUARY 1969

STUDY OF DUST DEVILS AS RELATED TO THE MARTIAN YELLOW CLOUDS

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Volume II-Basic Data (Appendix to Final Report)

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

NASW-716.3

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WESTERN DIVISION

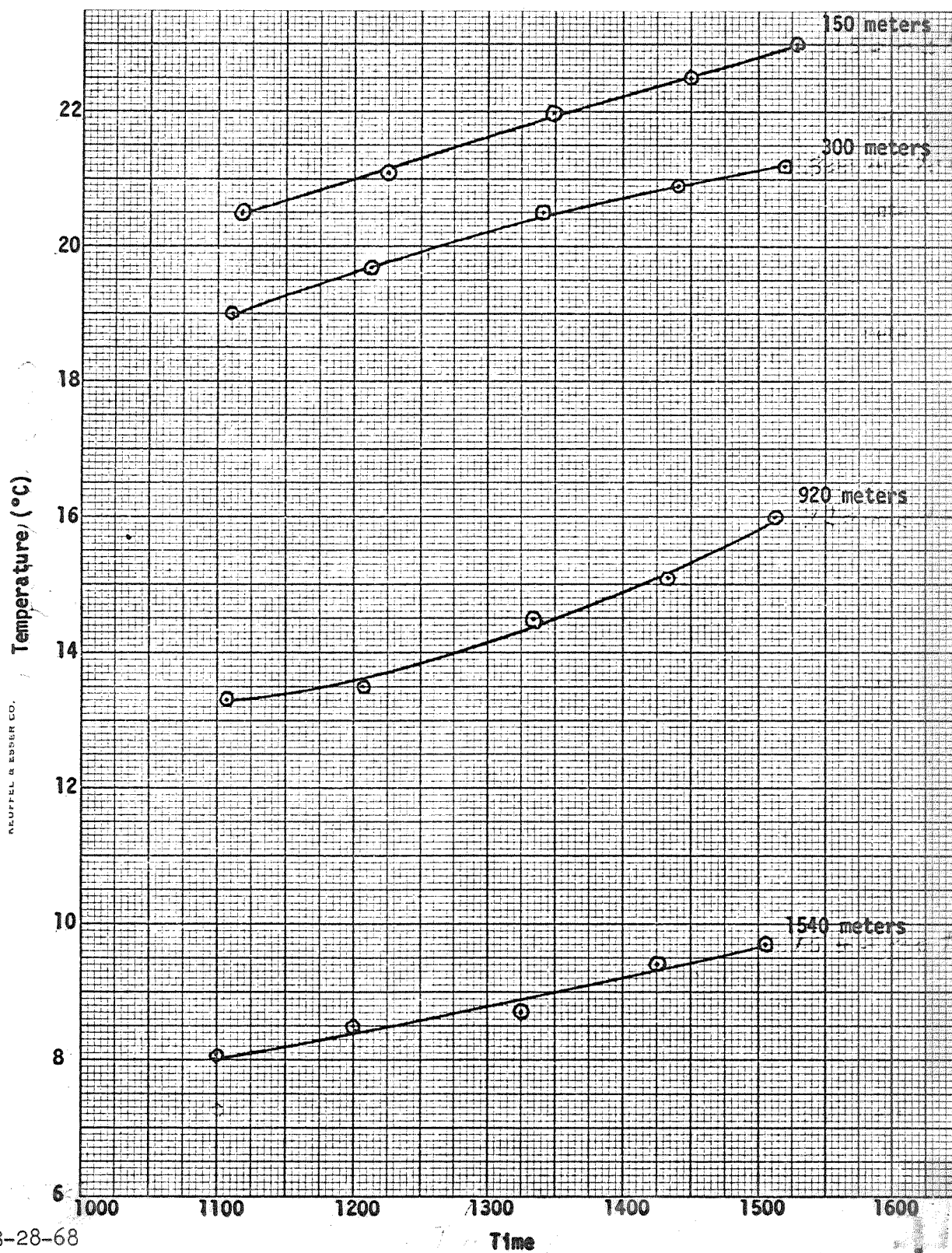


PREFACE

This report summarizes work performed by the Space Sciences Department, McDonnell Douglas Astronautics Company - Western Division for the National Aeronautics and Space Administration under Contract NASw-1620. The work consisted of field experimental studies of dust devils, the establishment of a quantitative dust devil model, and the transformation of this model to Martian conditions to determine whether dust devils could occur on Mars and be responsible for the Martian yellow clouds. Volume I comprises the technical discussion and presents the program findings. The basic field experimental data are given in Volume II.

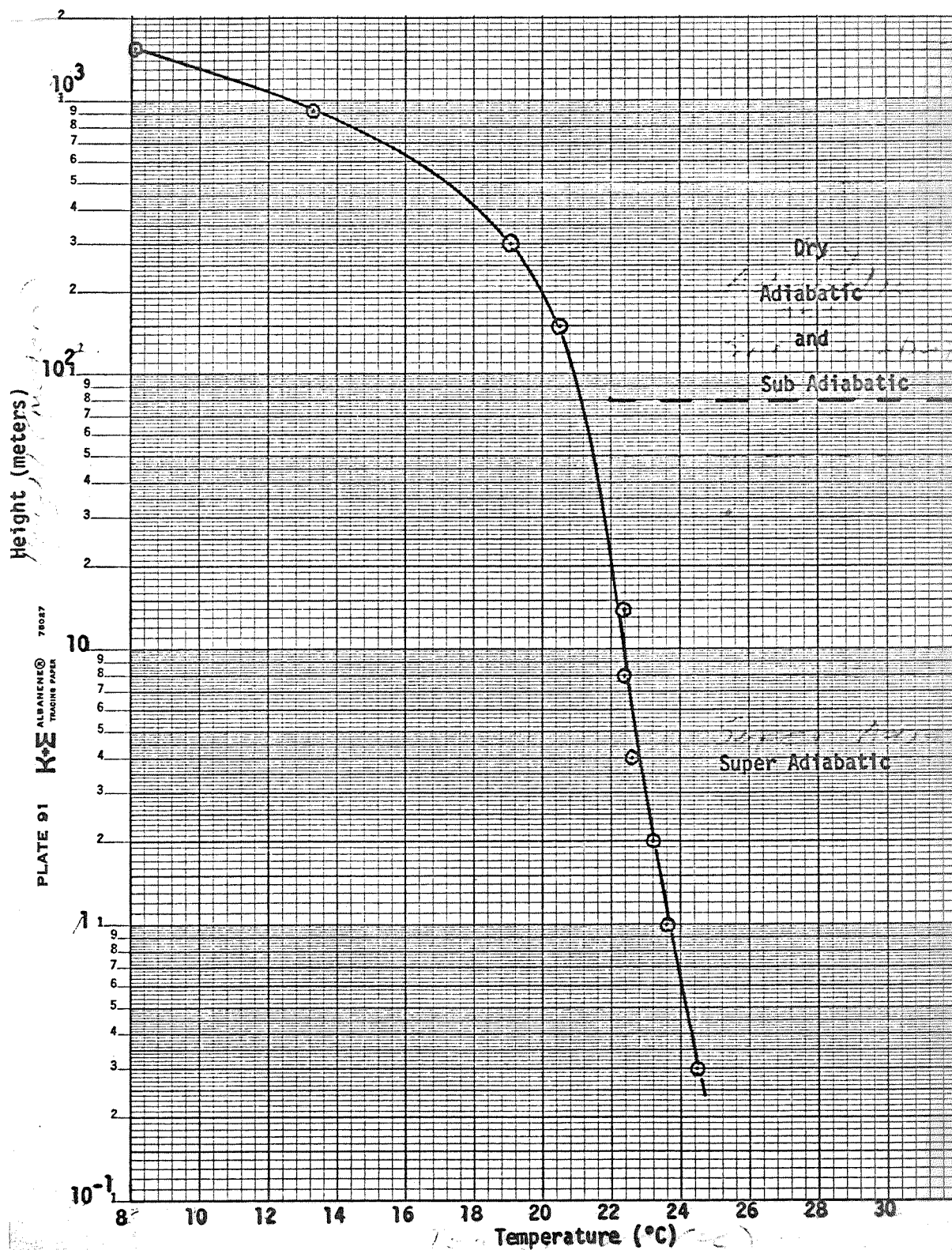
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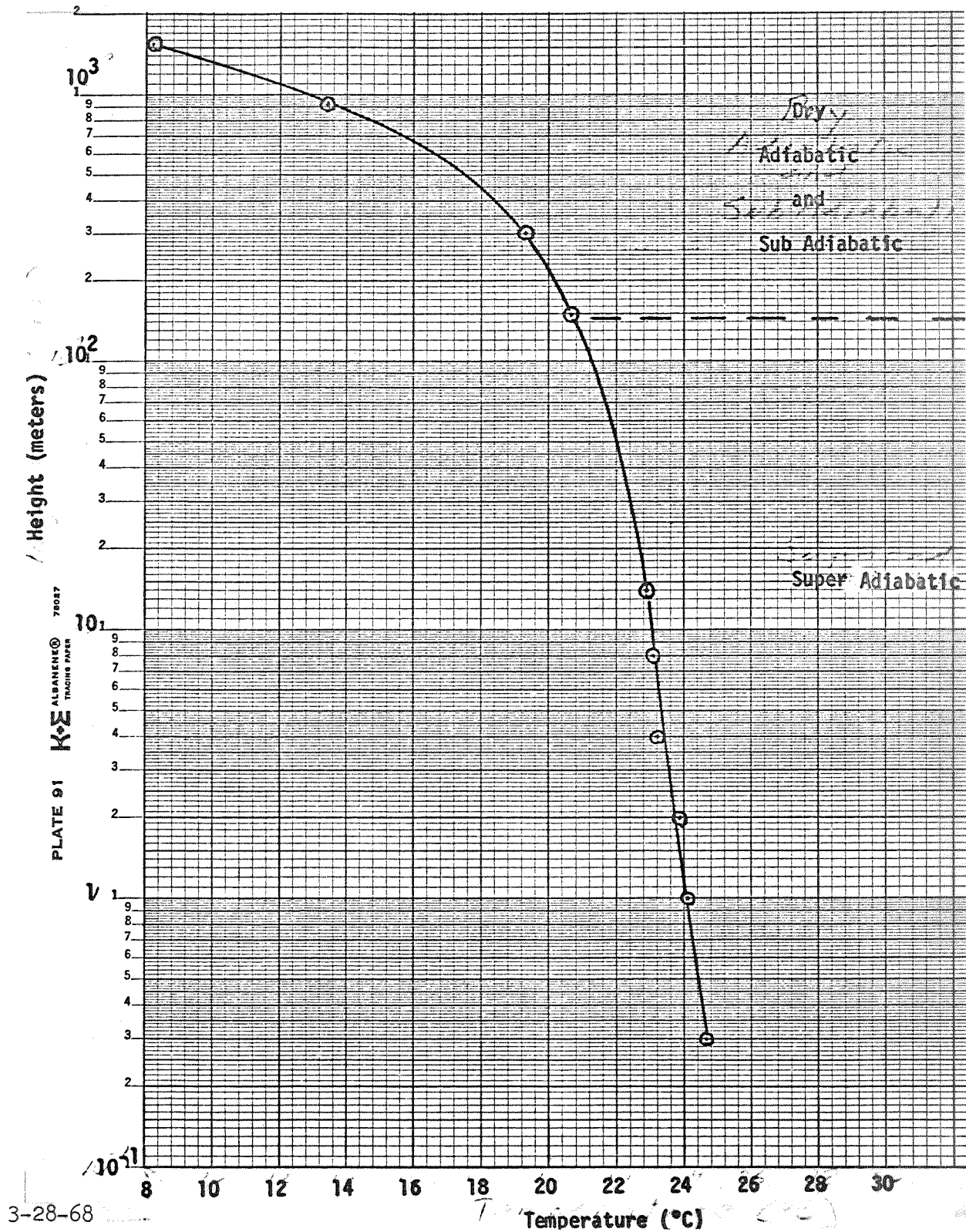
Aircraft Soundings



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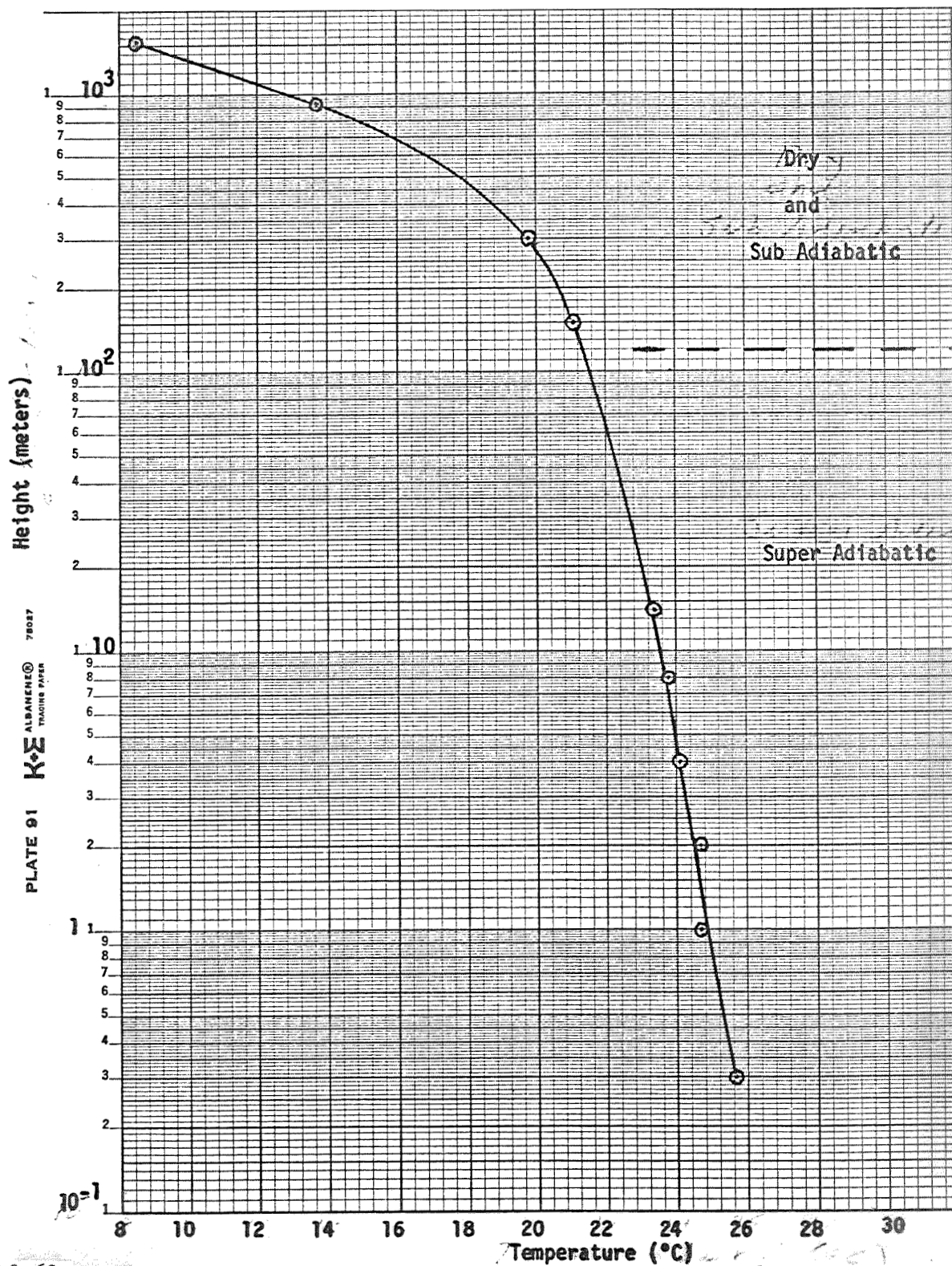
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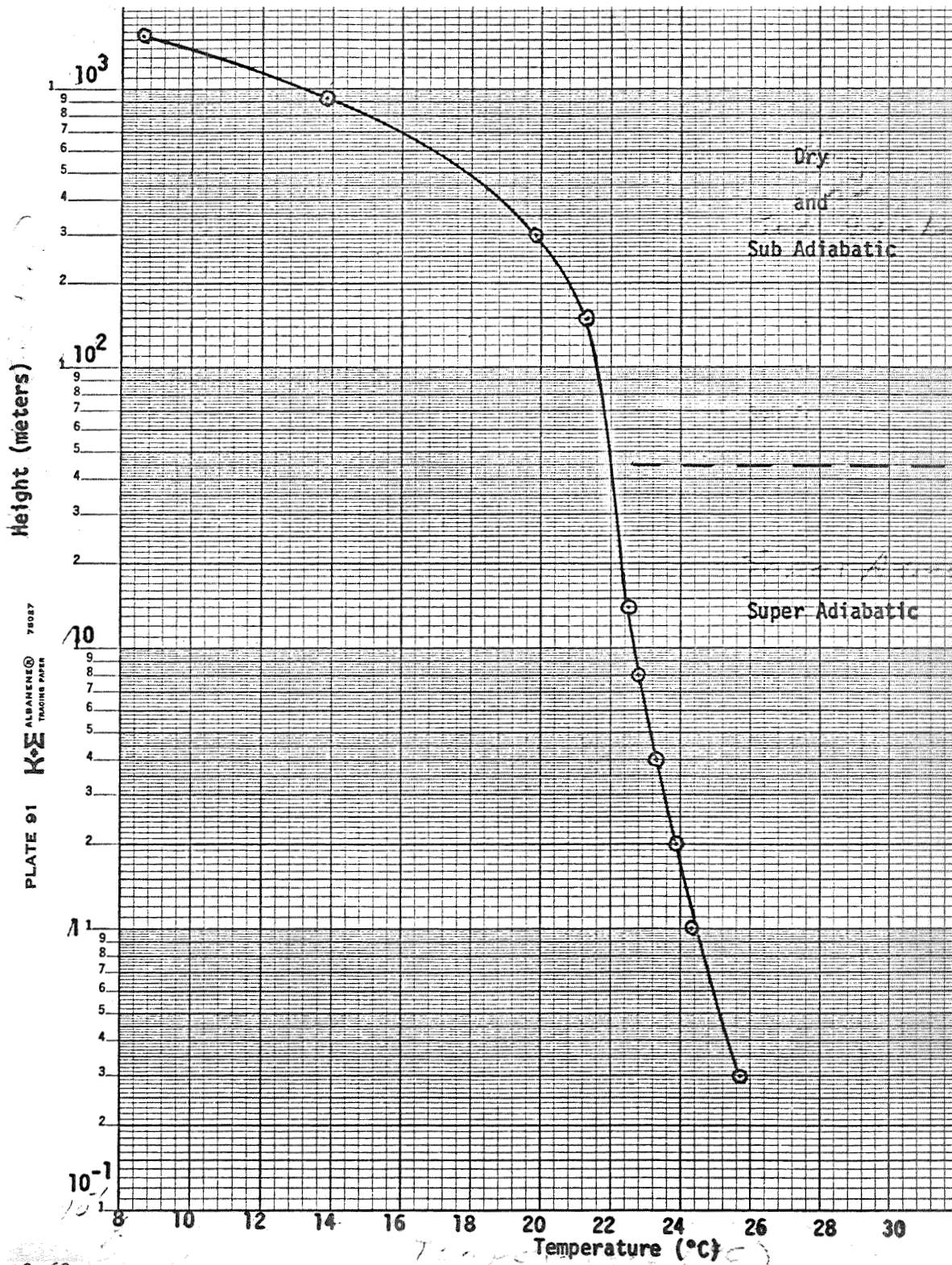
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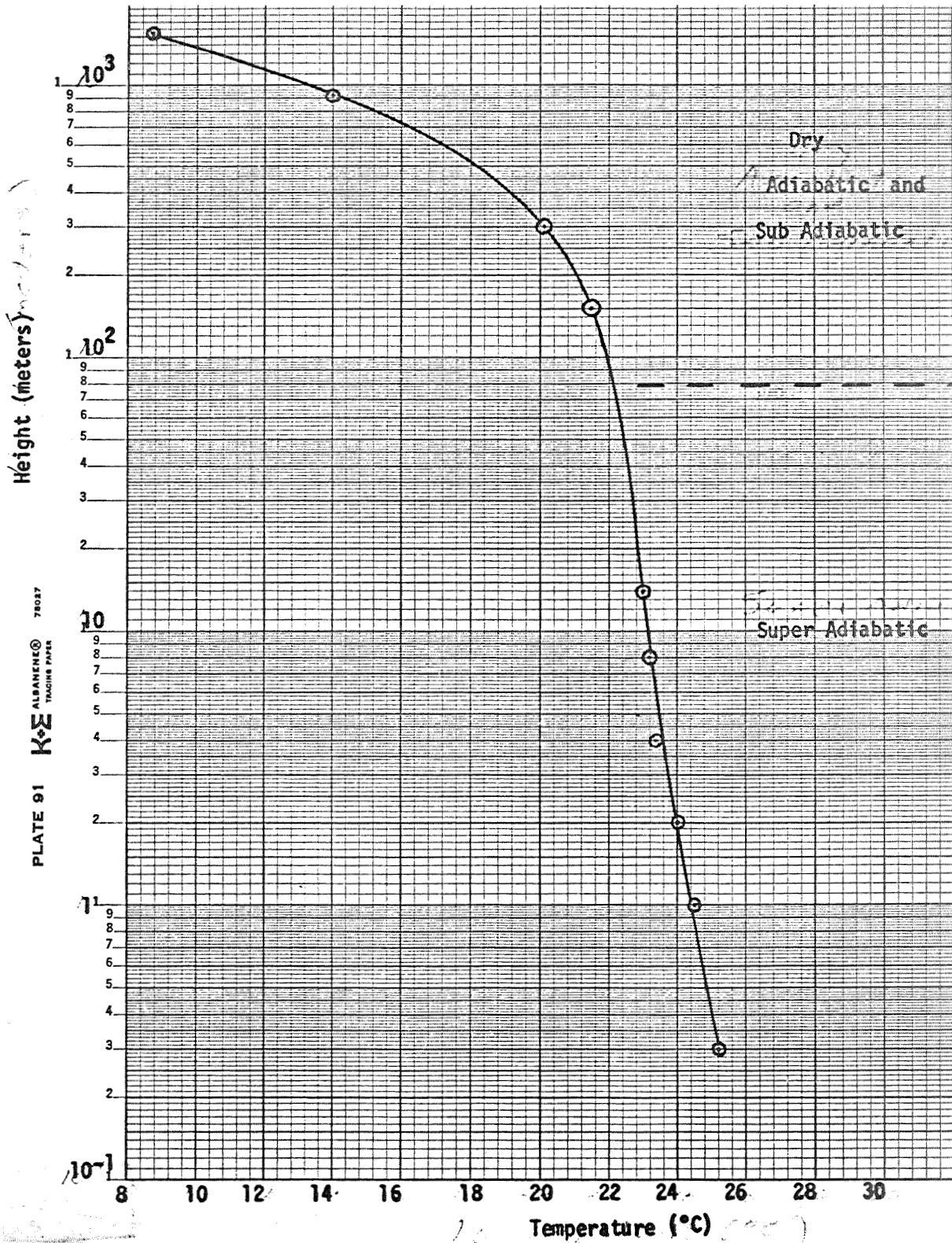
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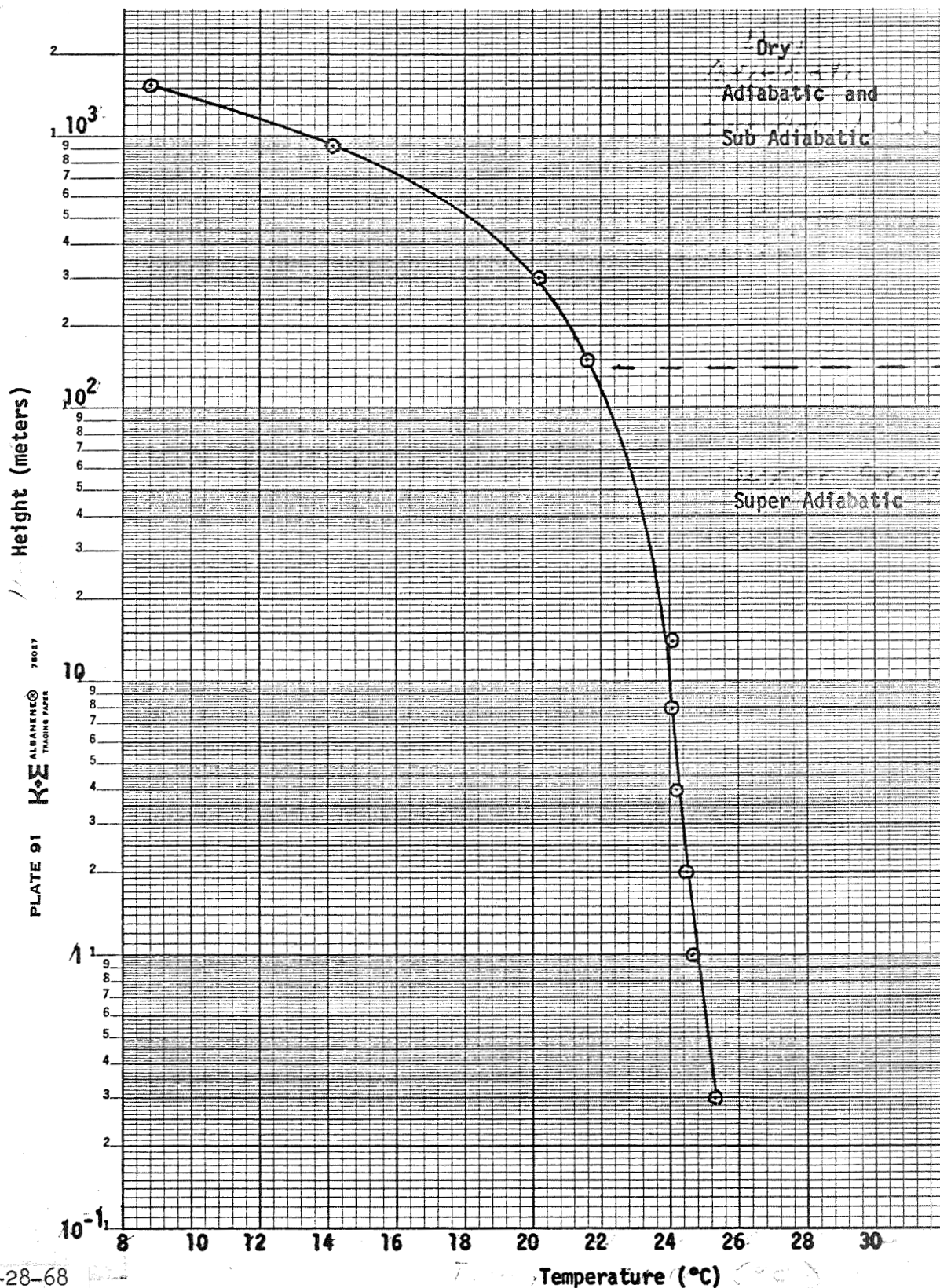
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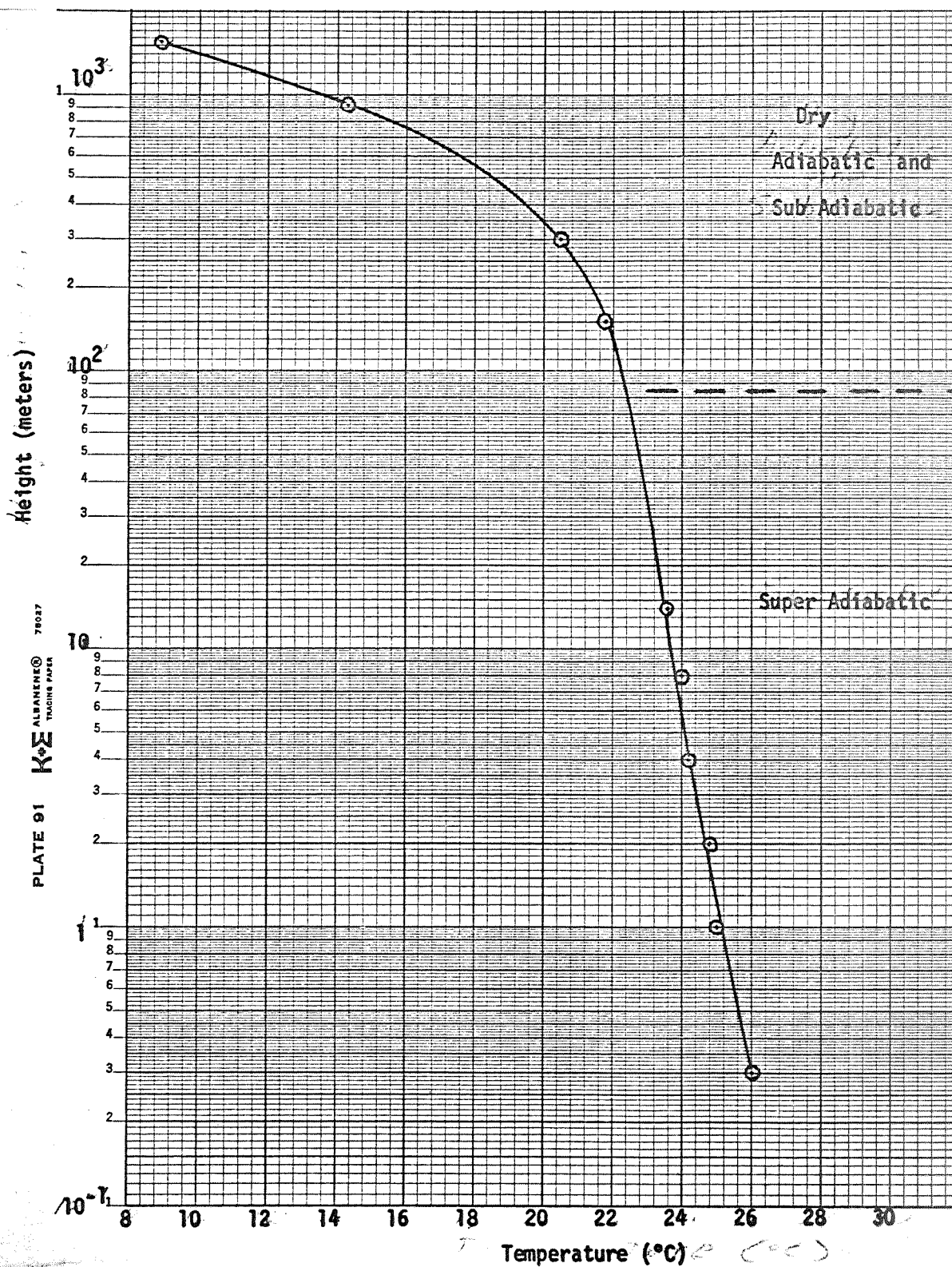
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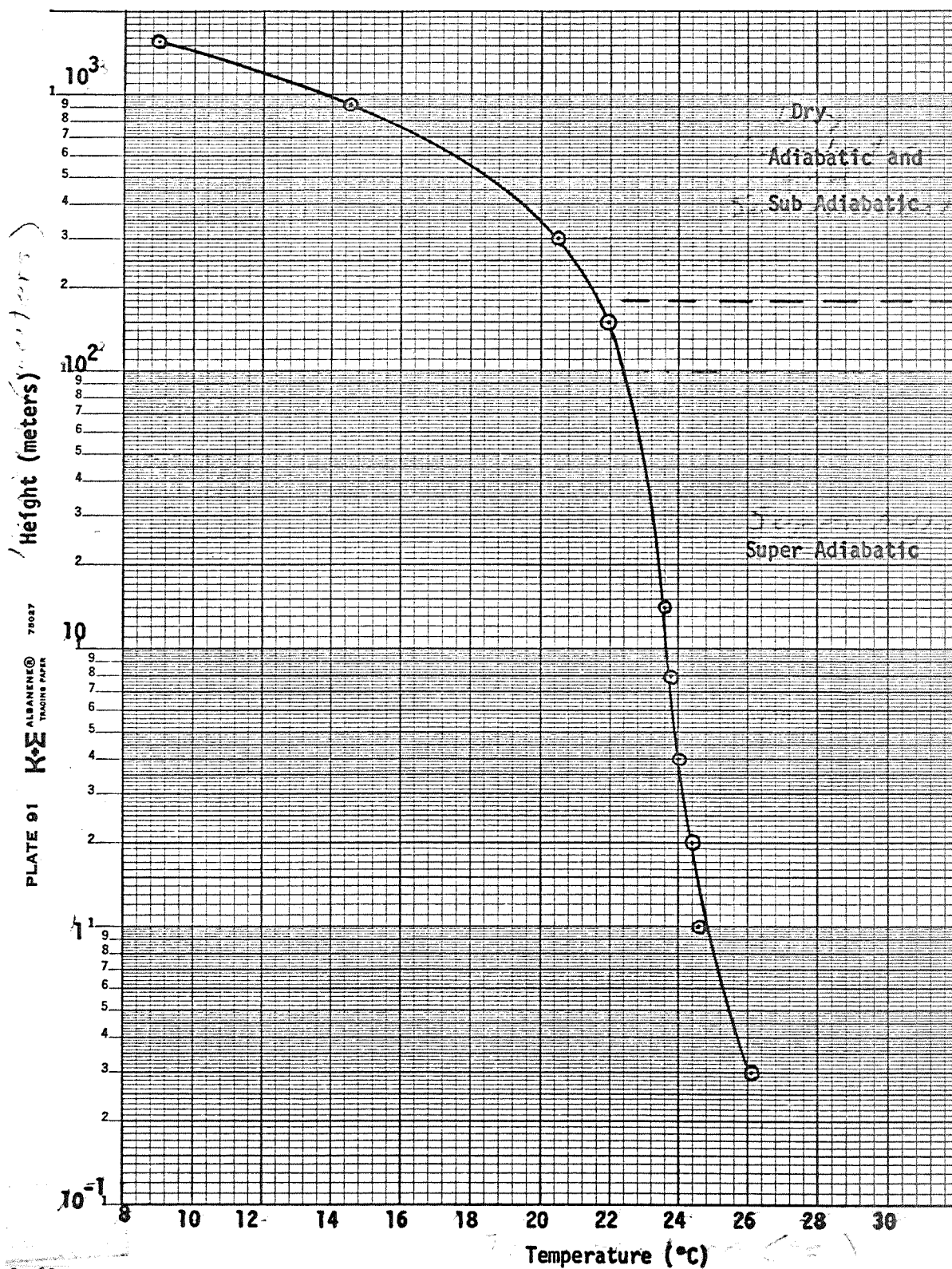
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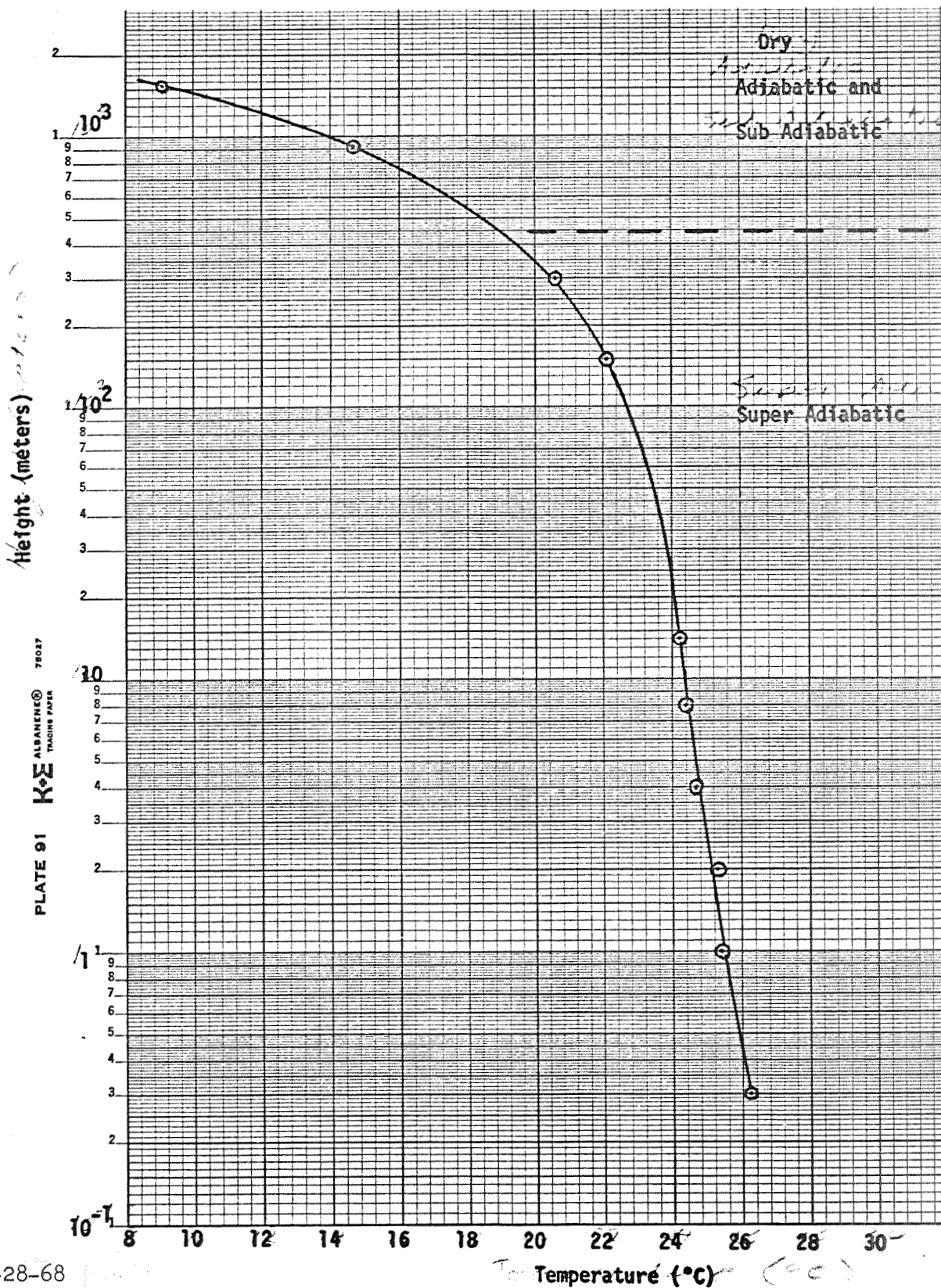
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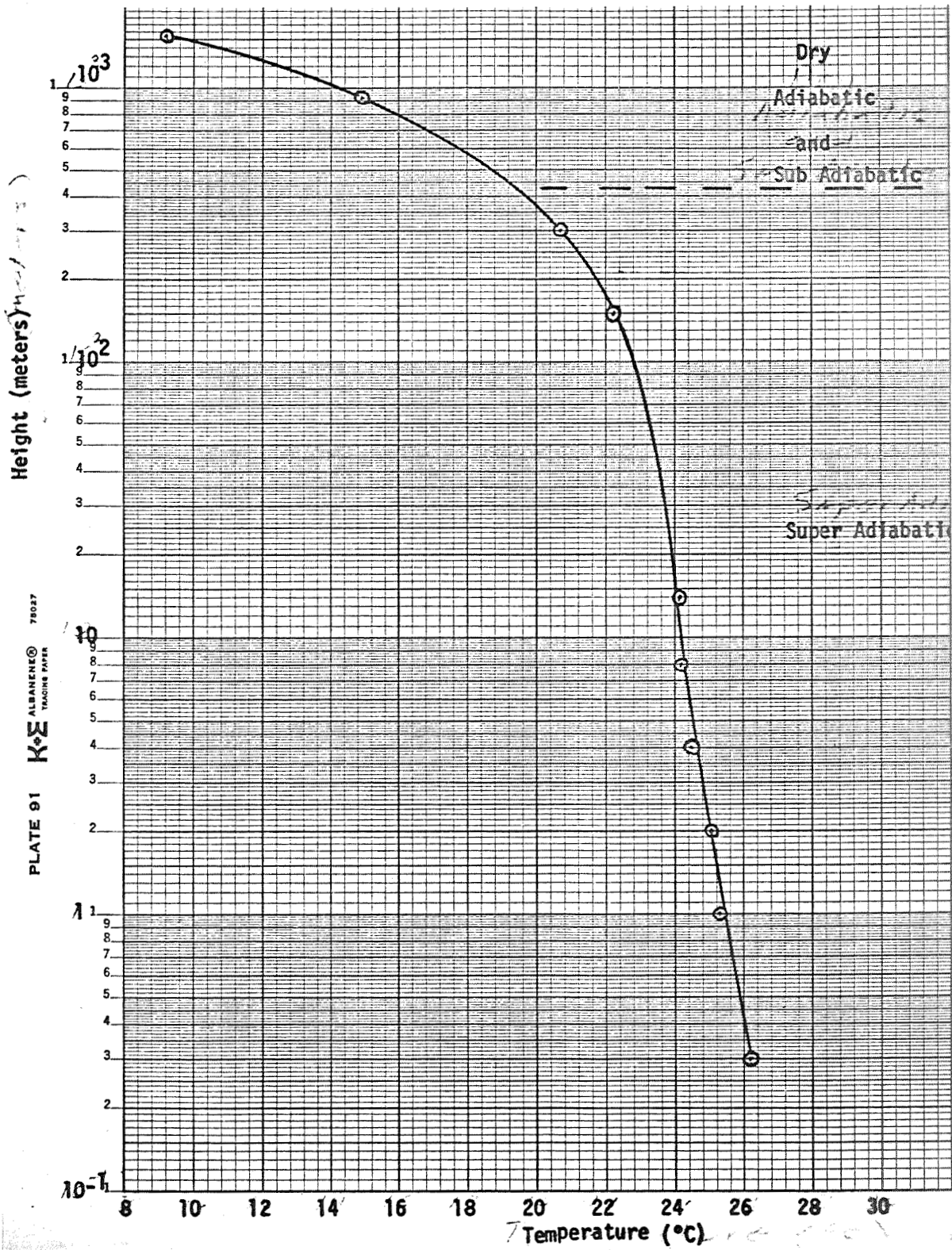
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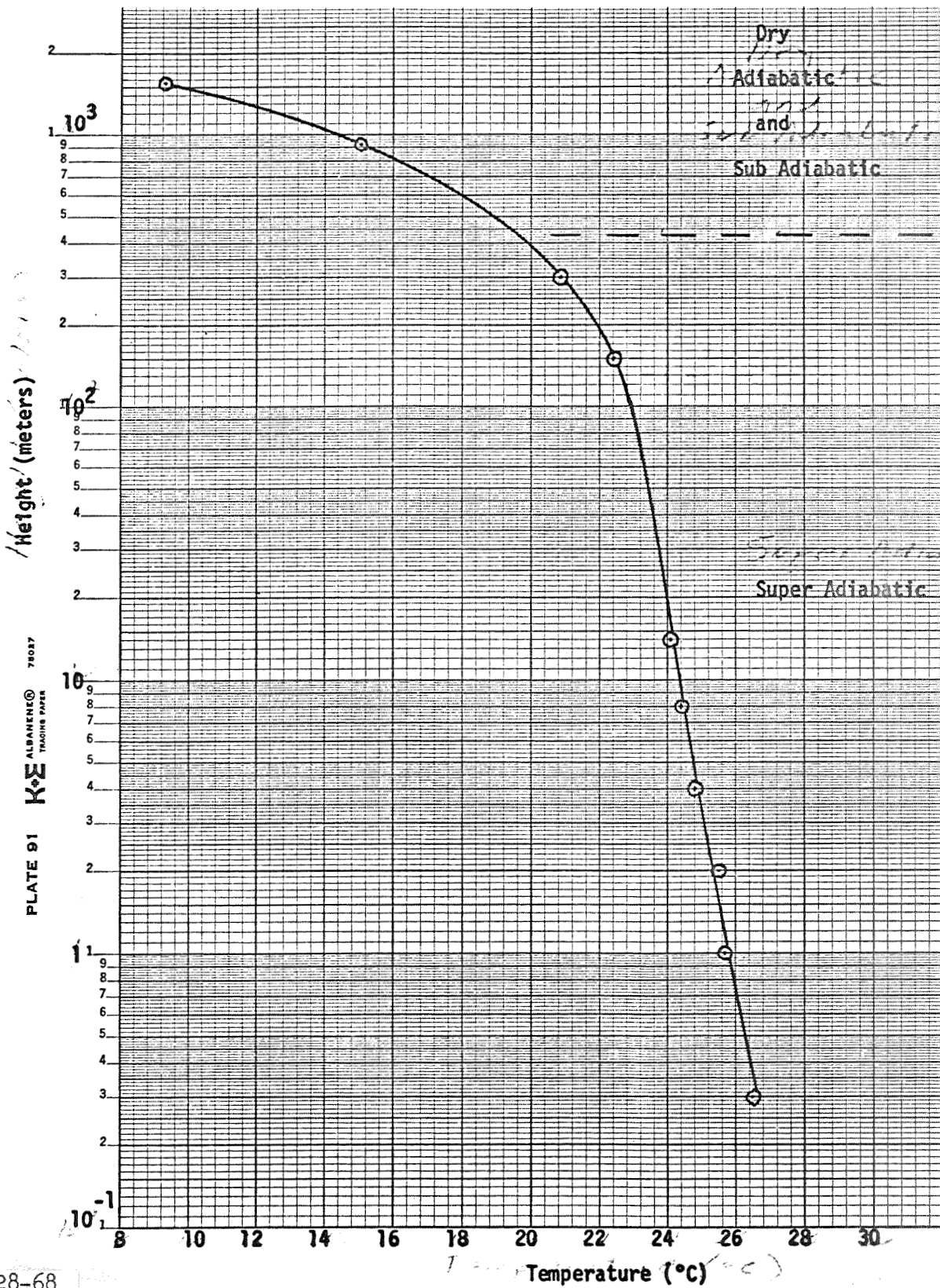
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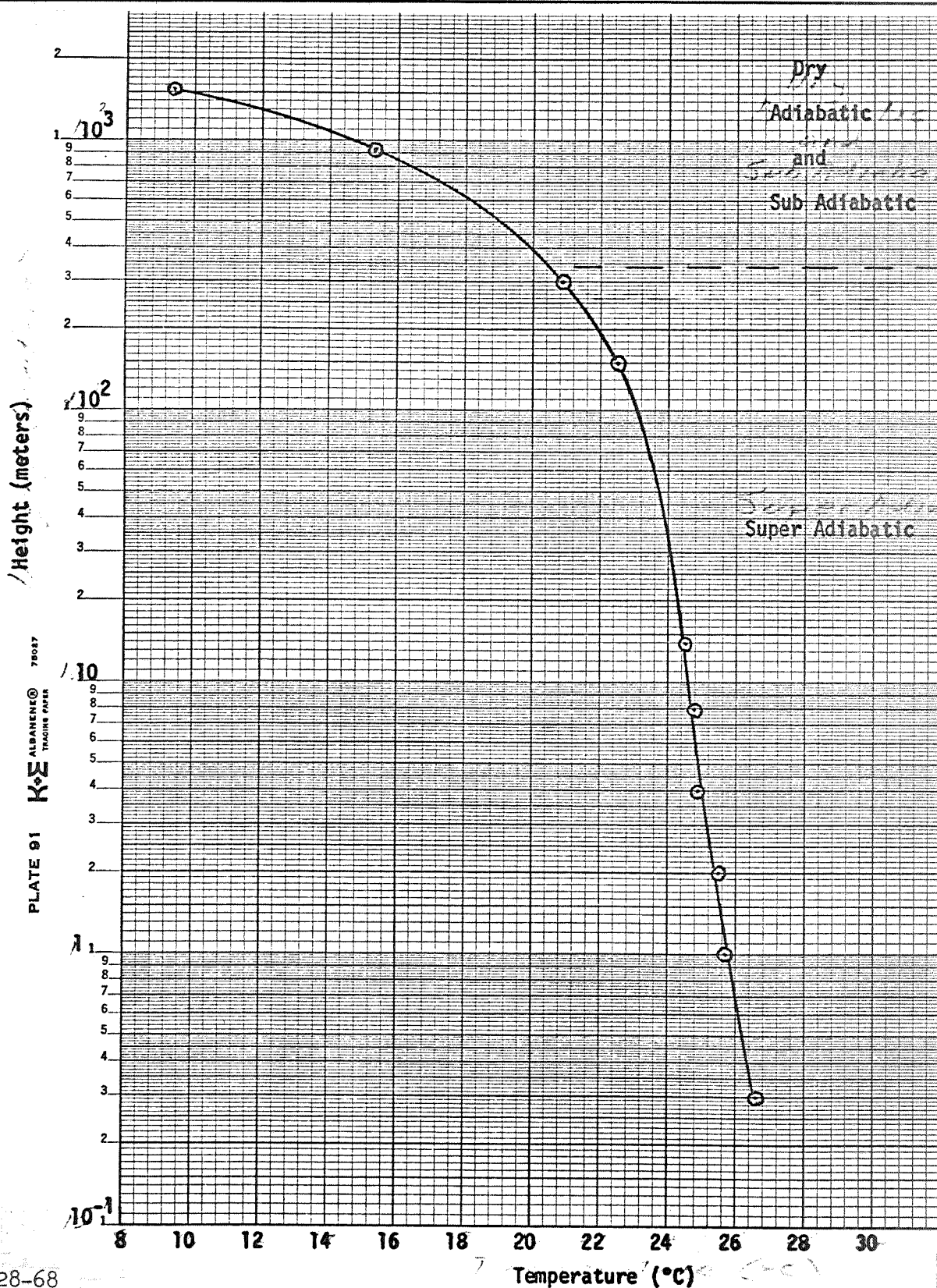
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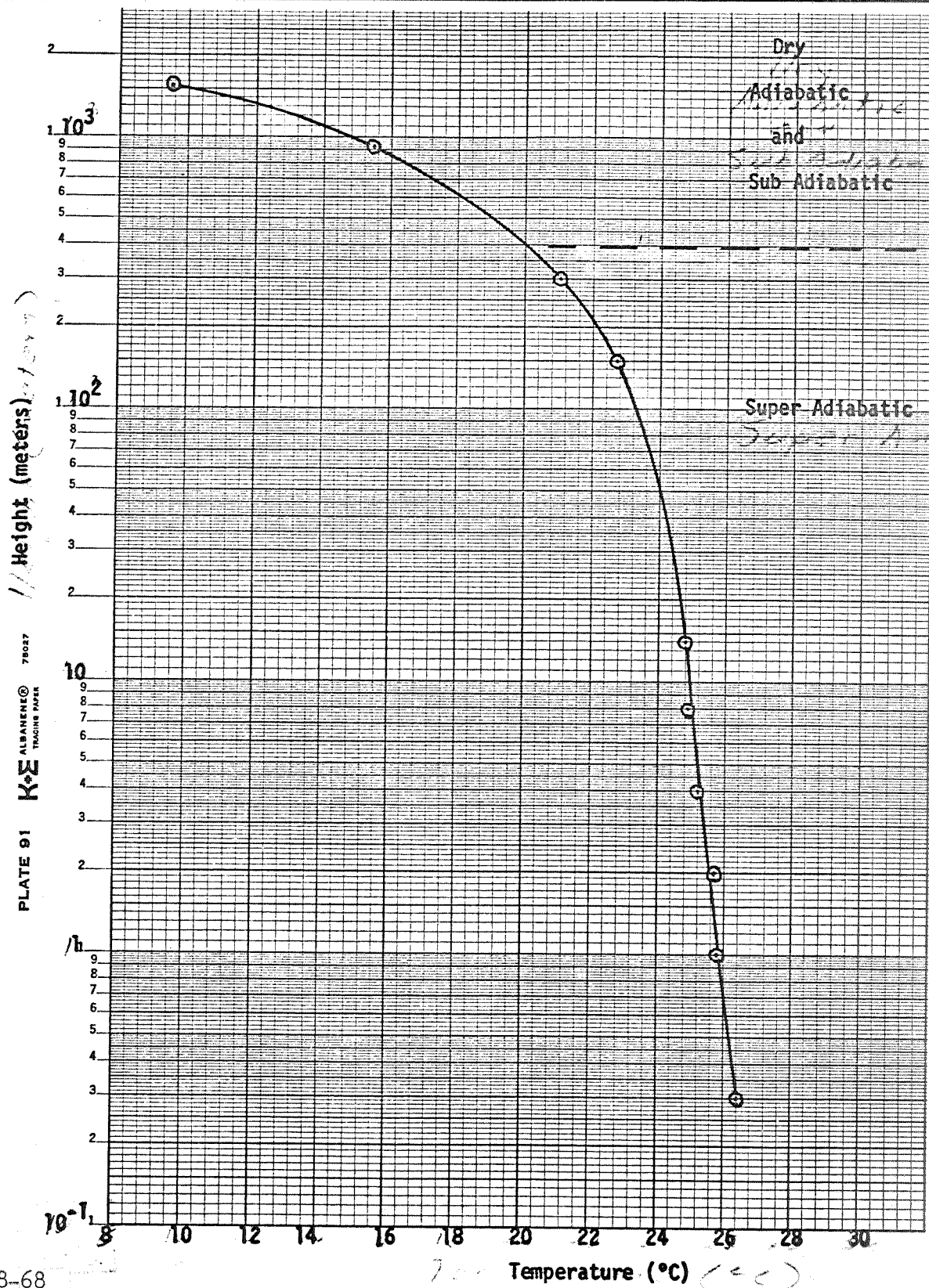
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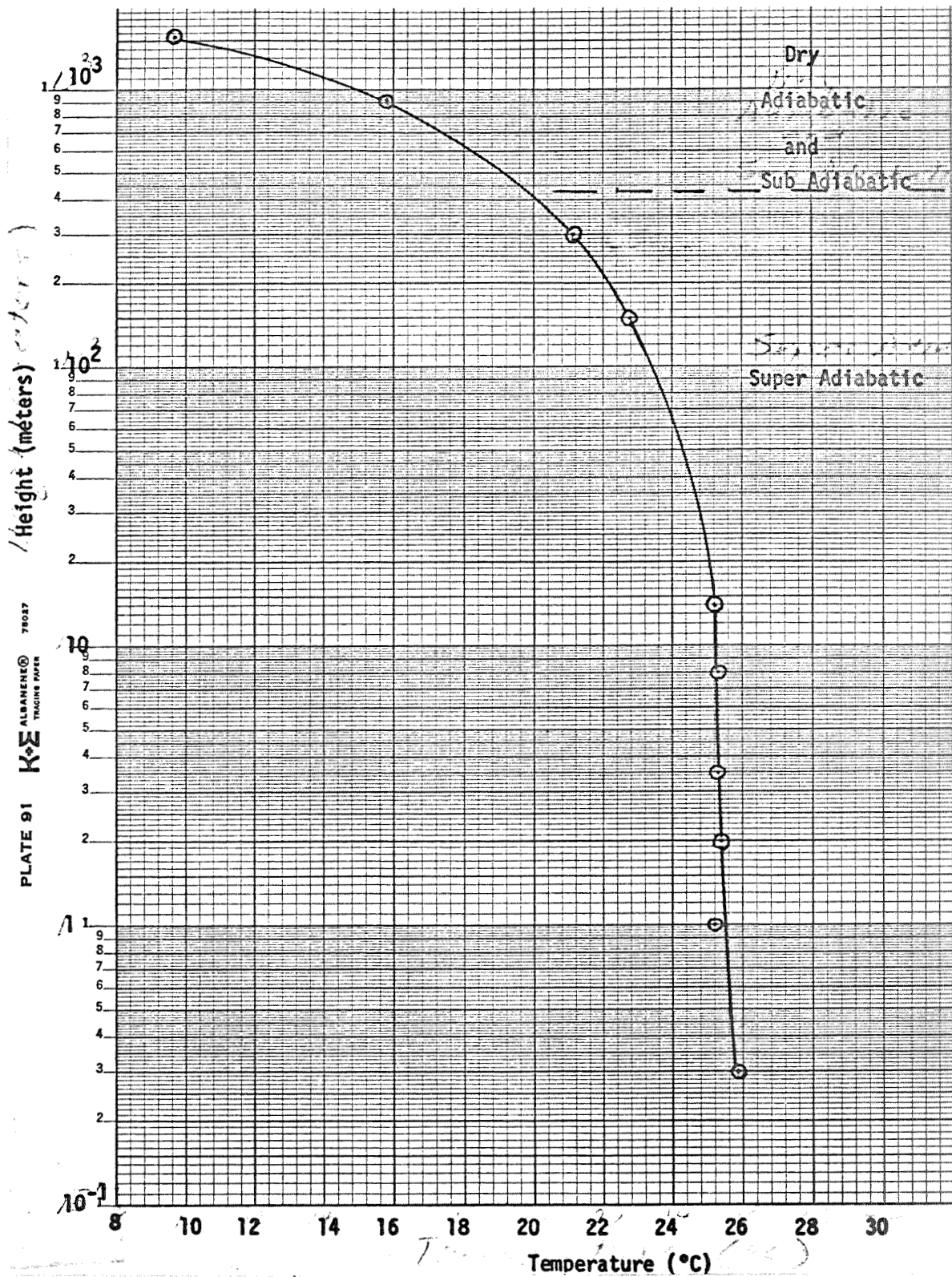
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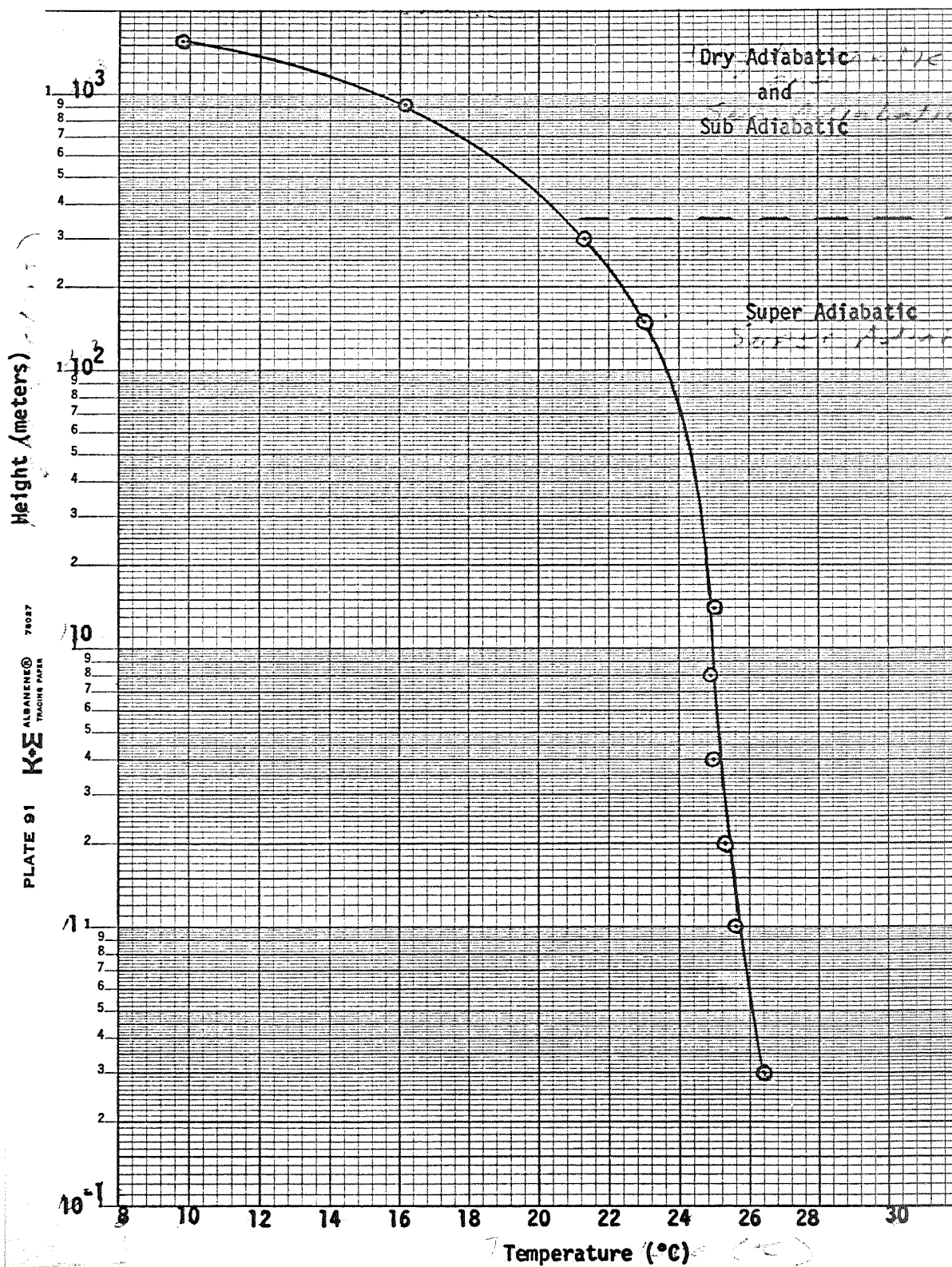
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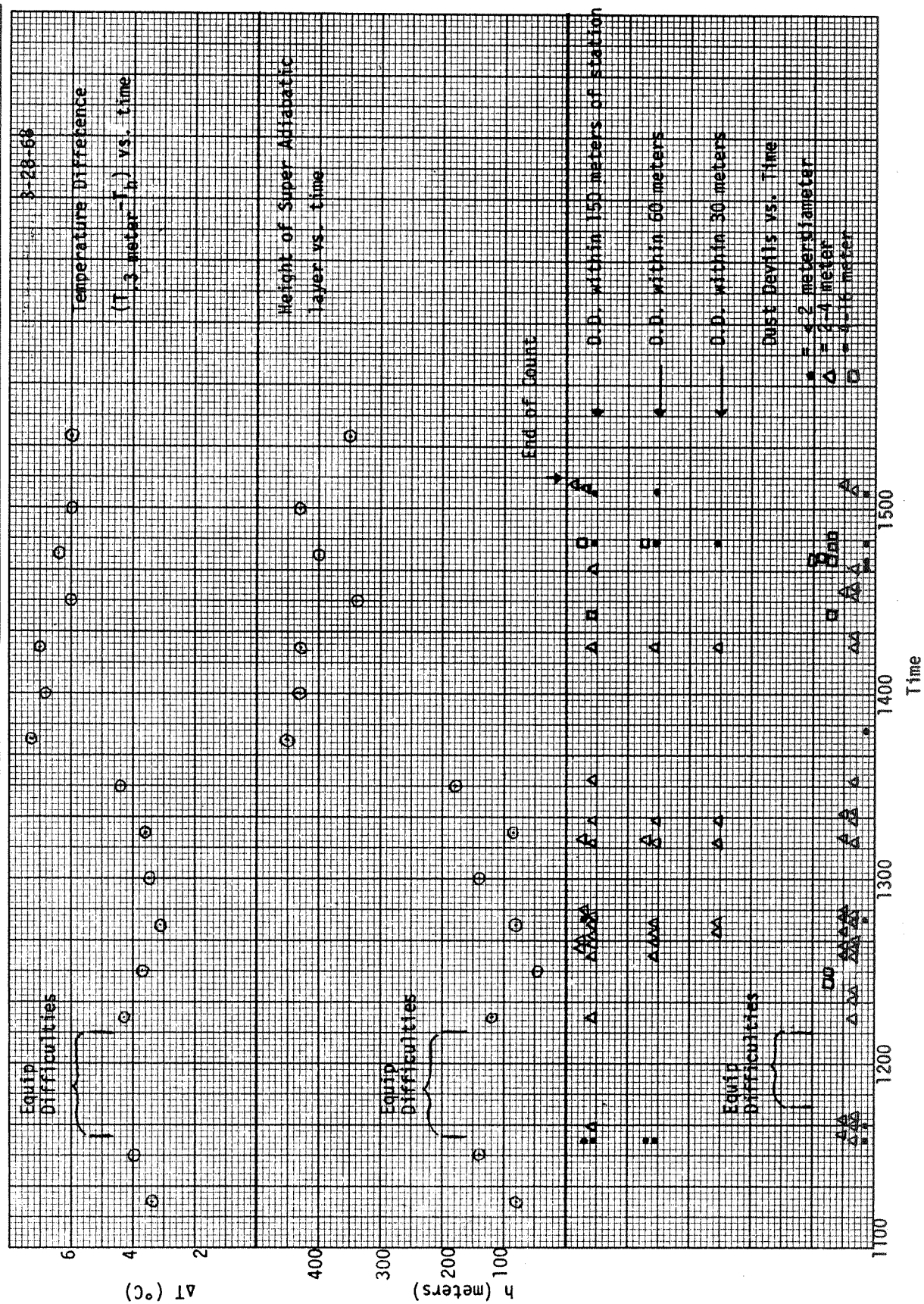
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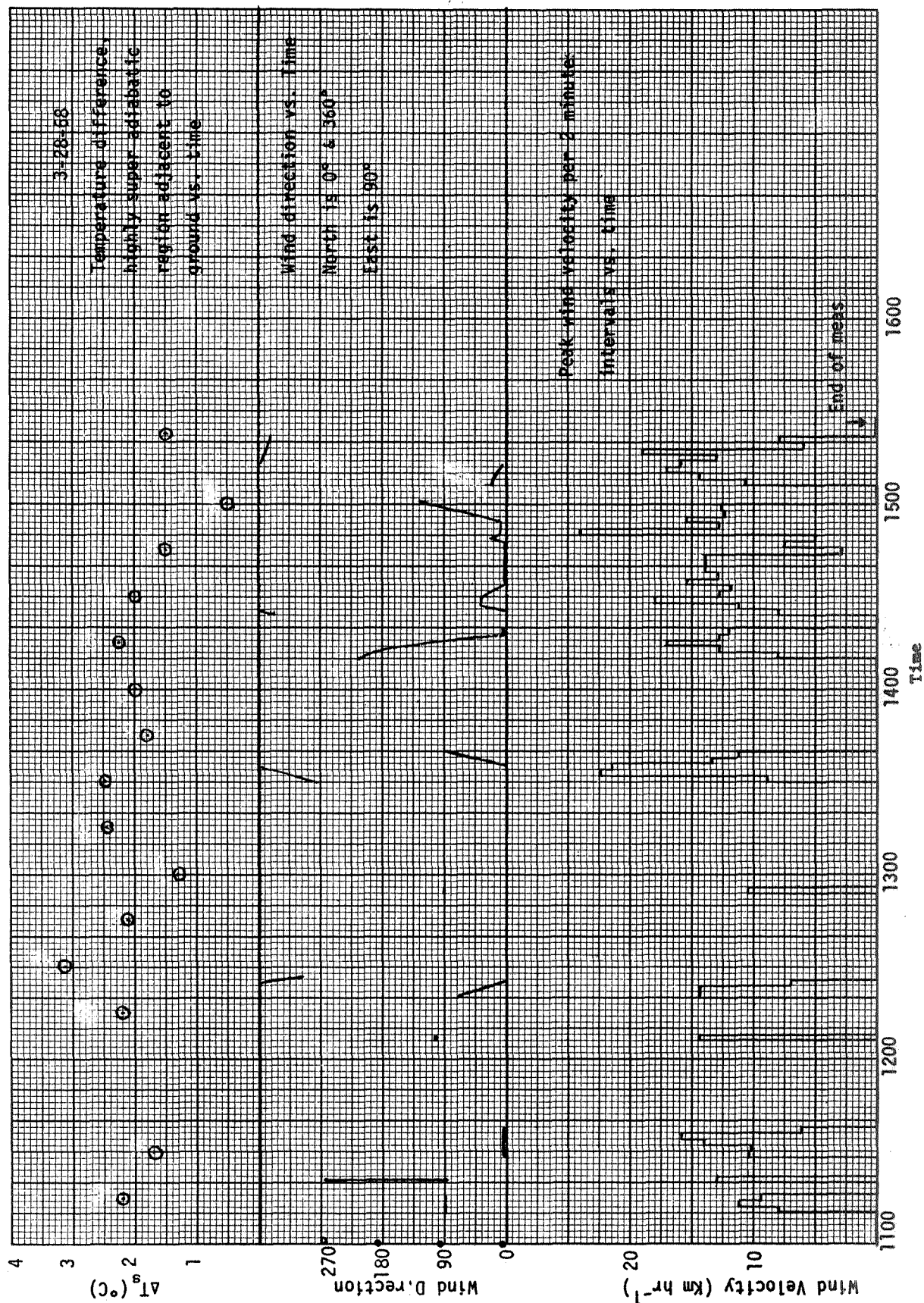
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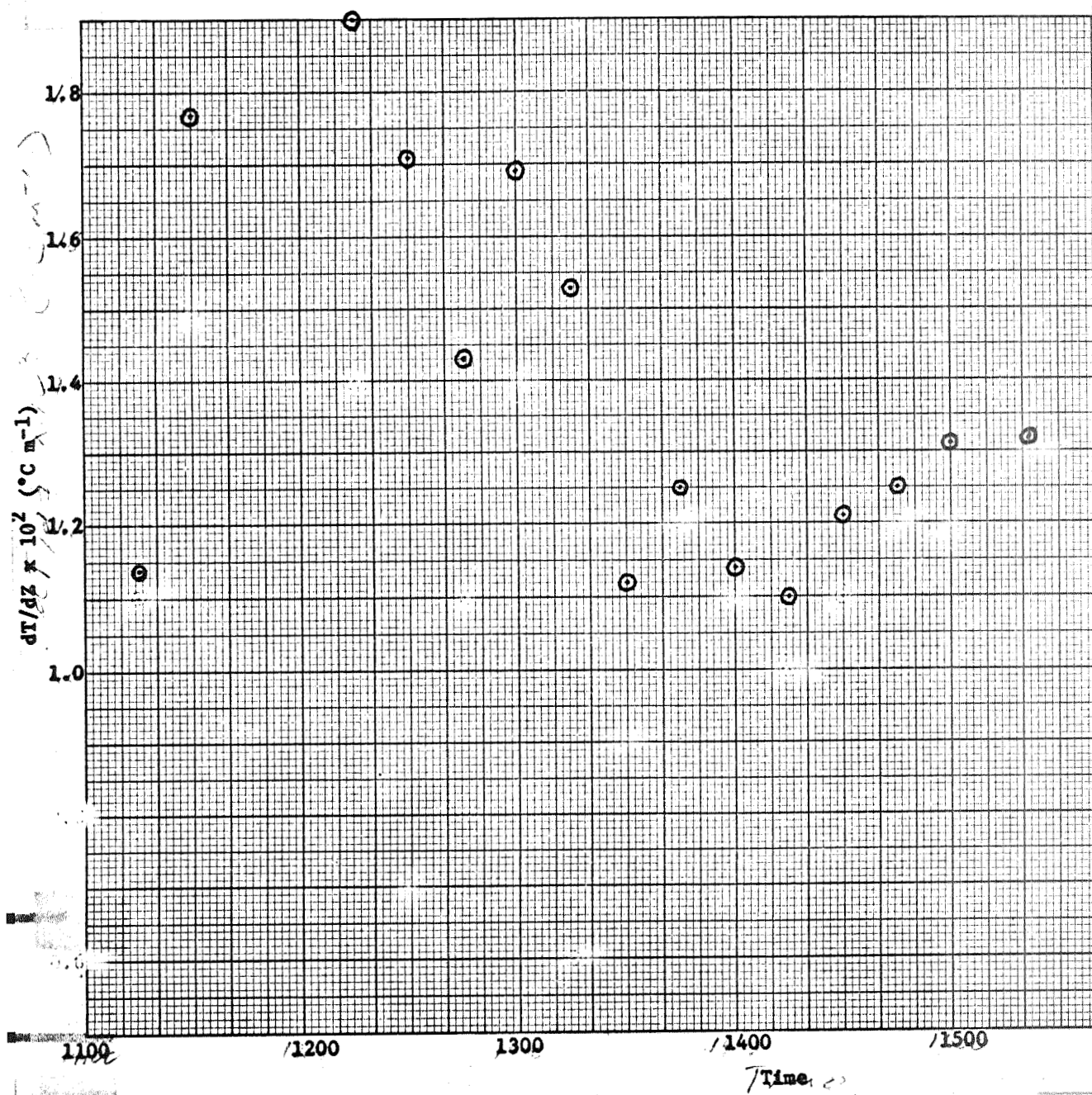


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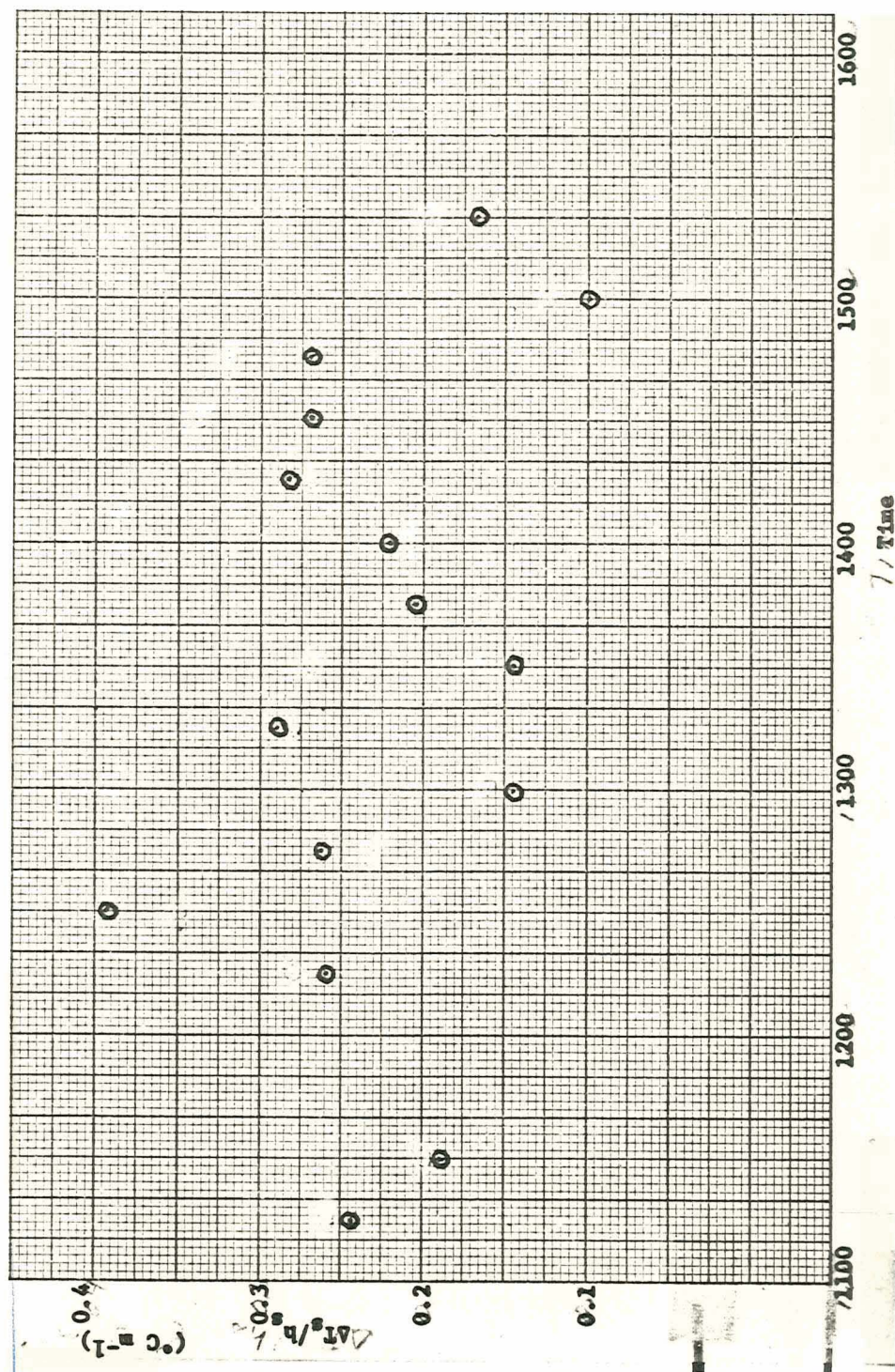




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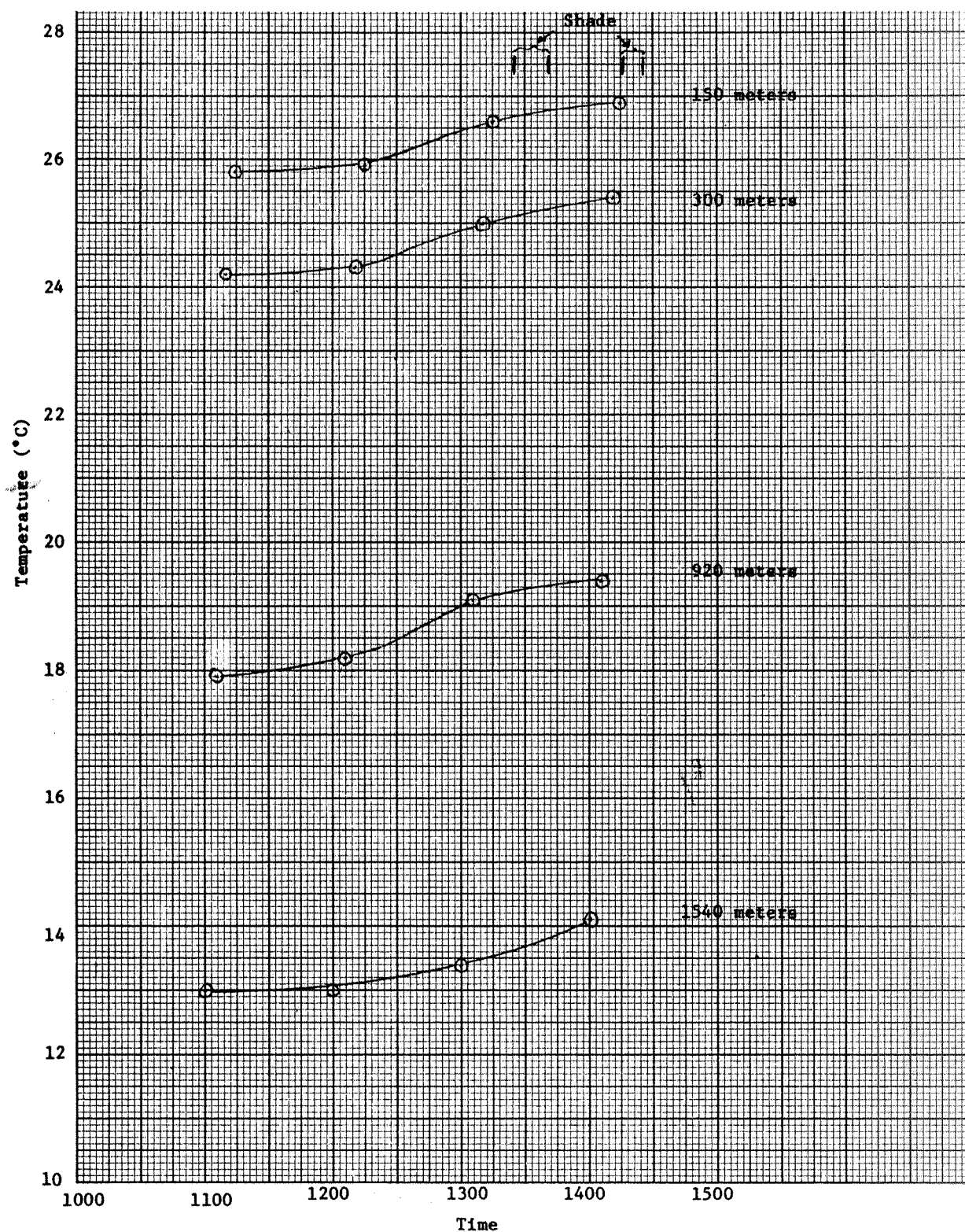
vs. Time



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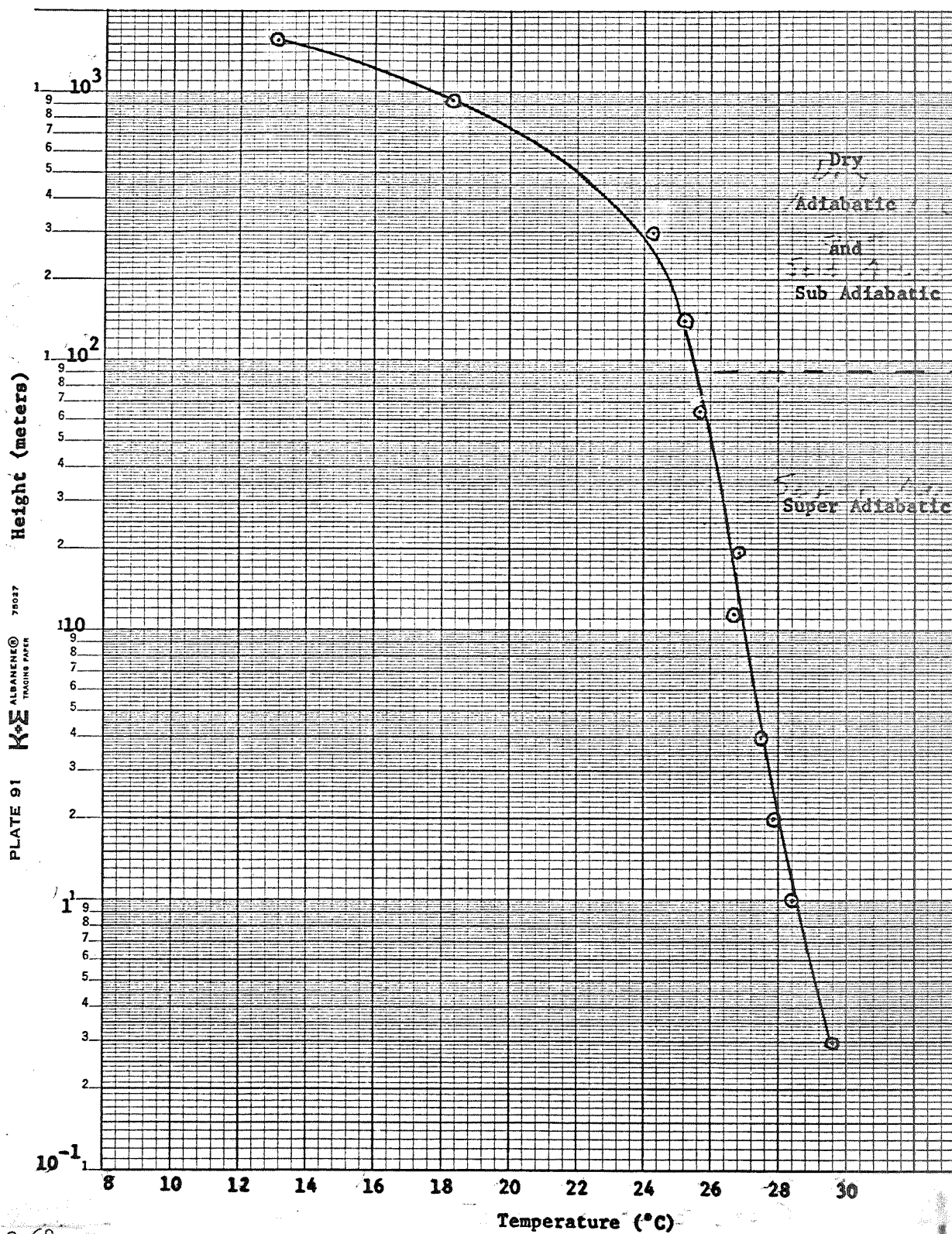
$\Delta T_s / h_s$ vs. Time

DATA FOR 5-3-68



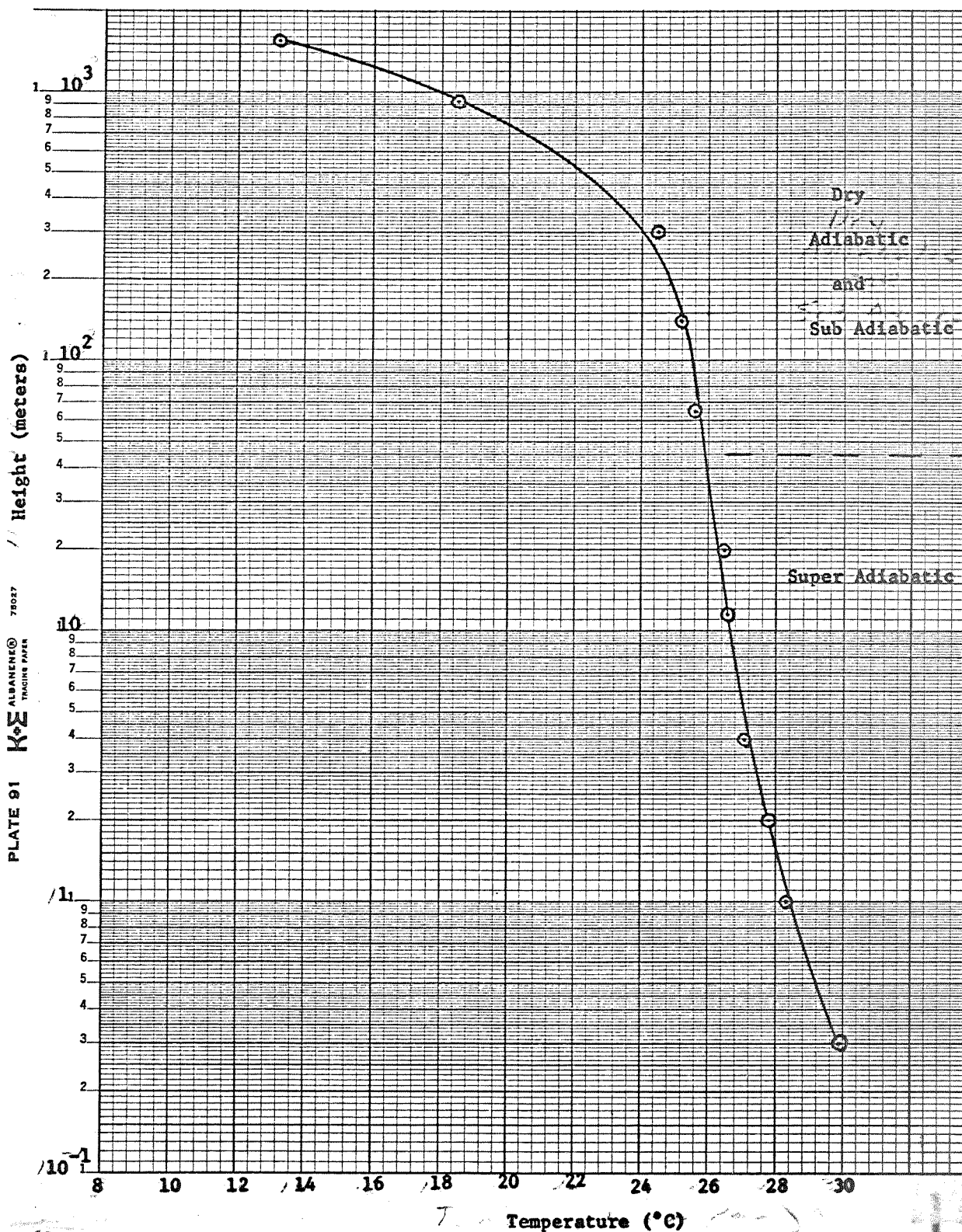
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Aircraft Soundings



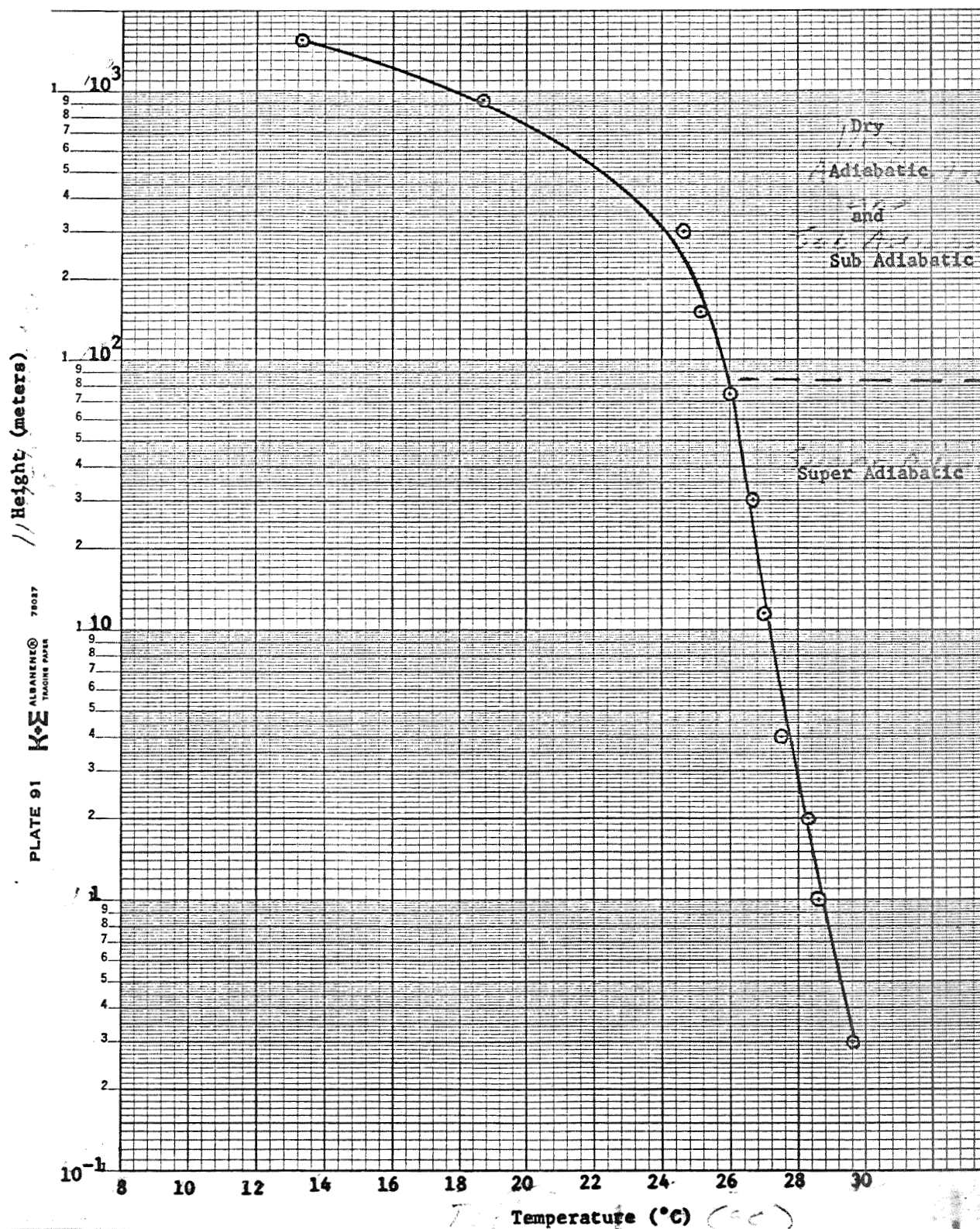
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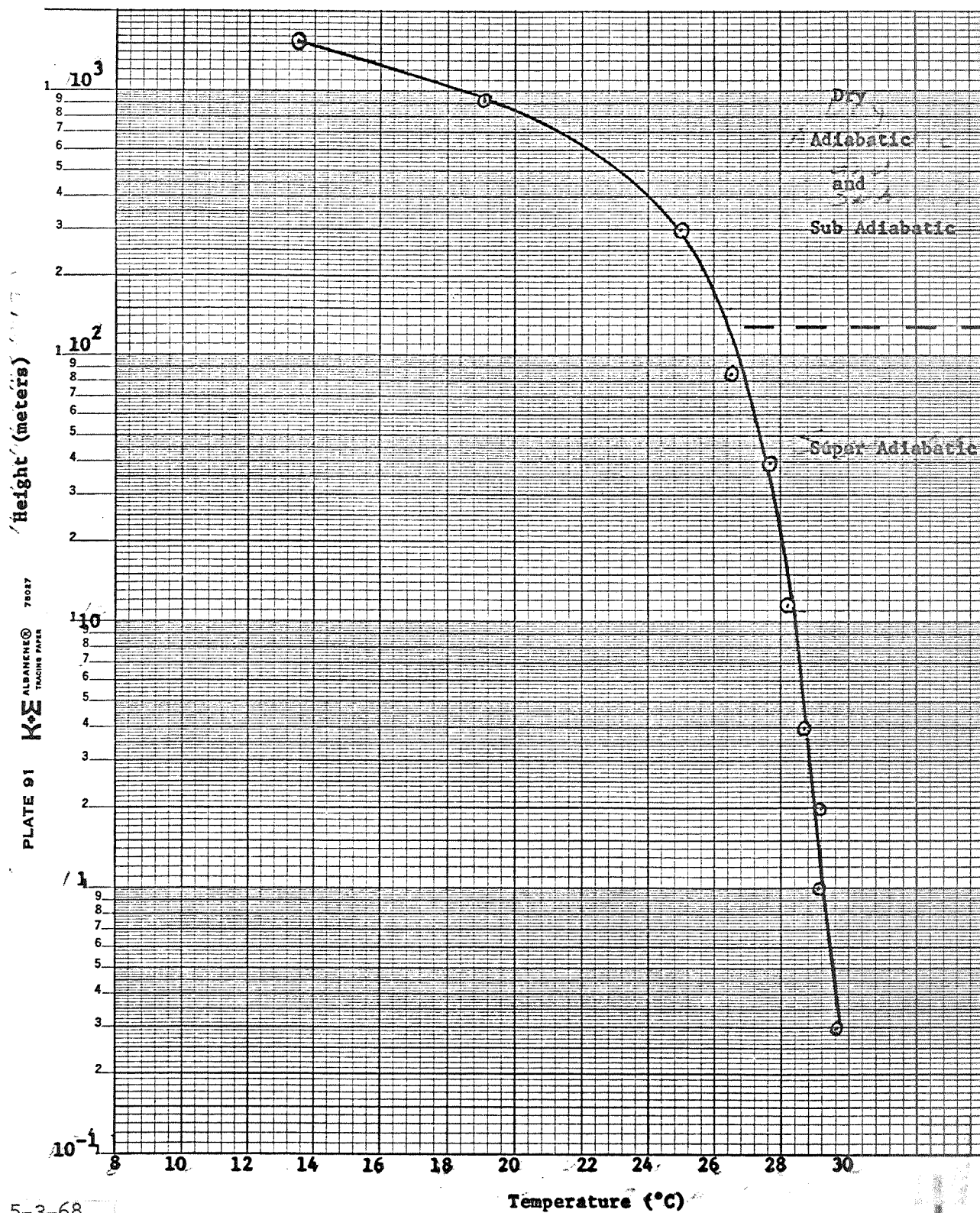
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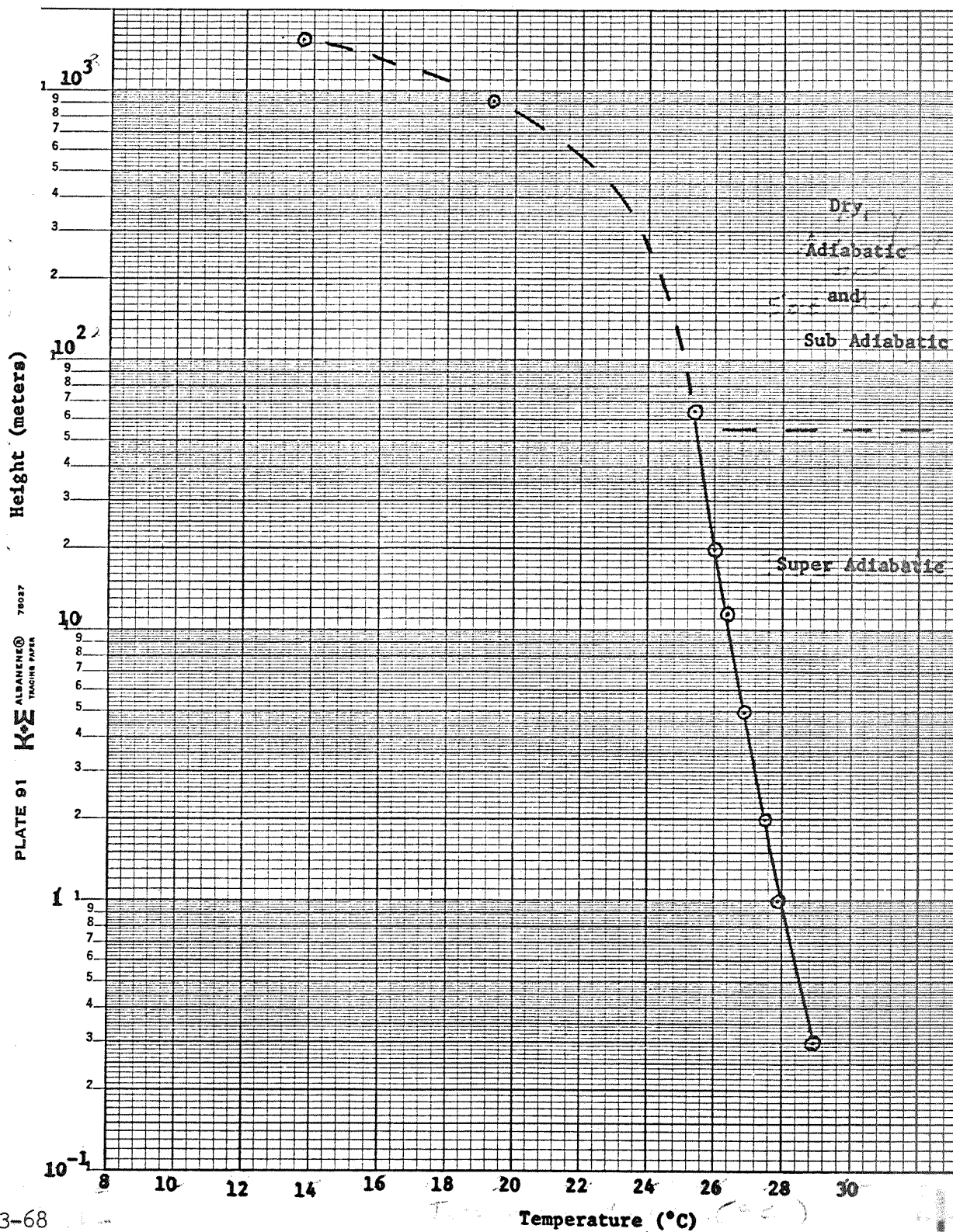
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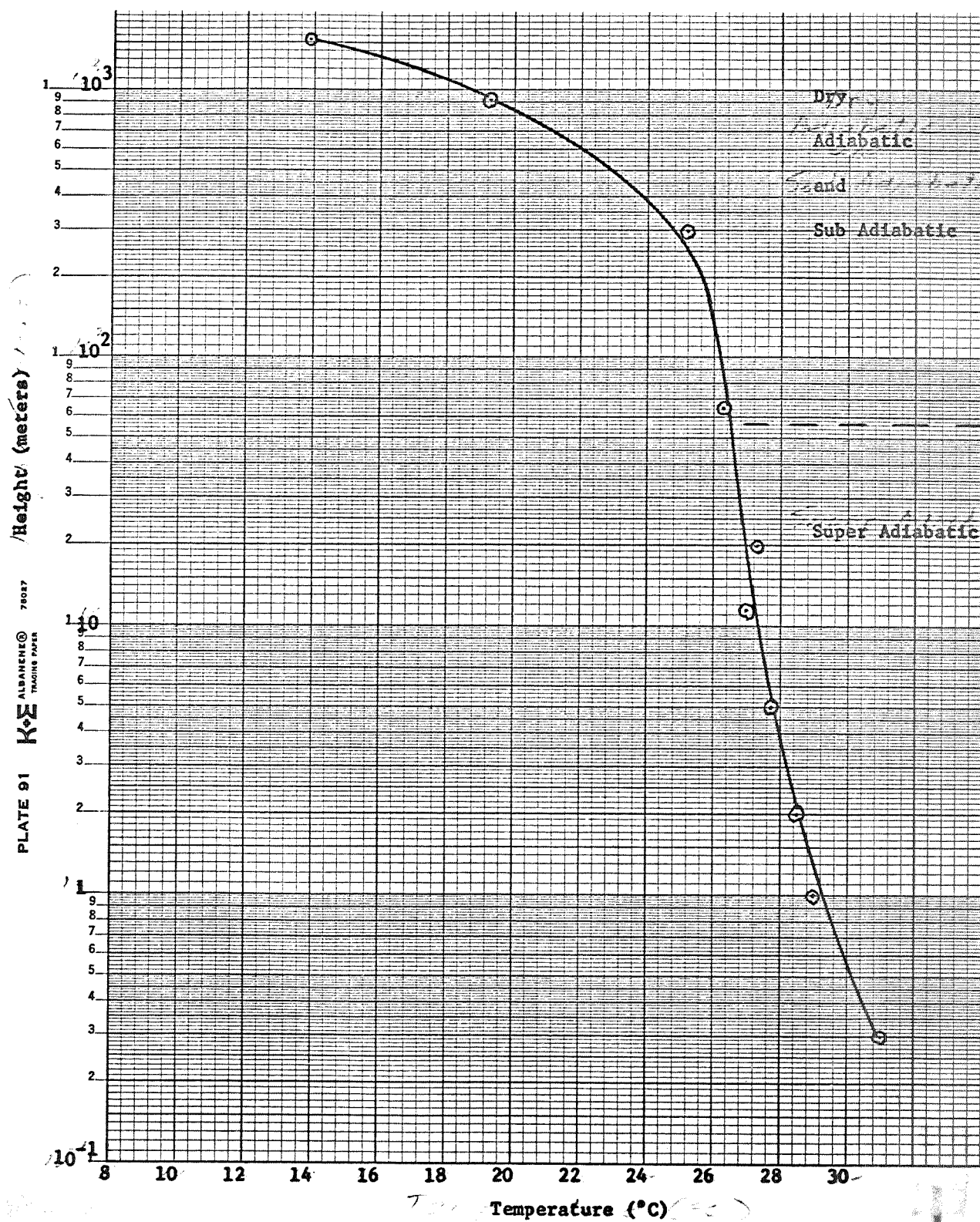
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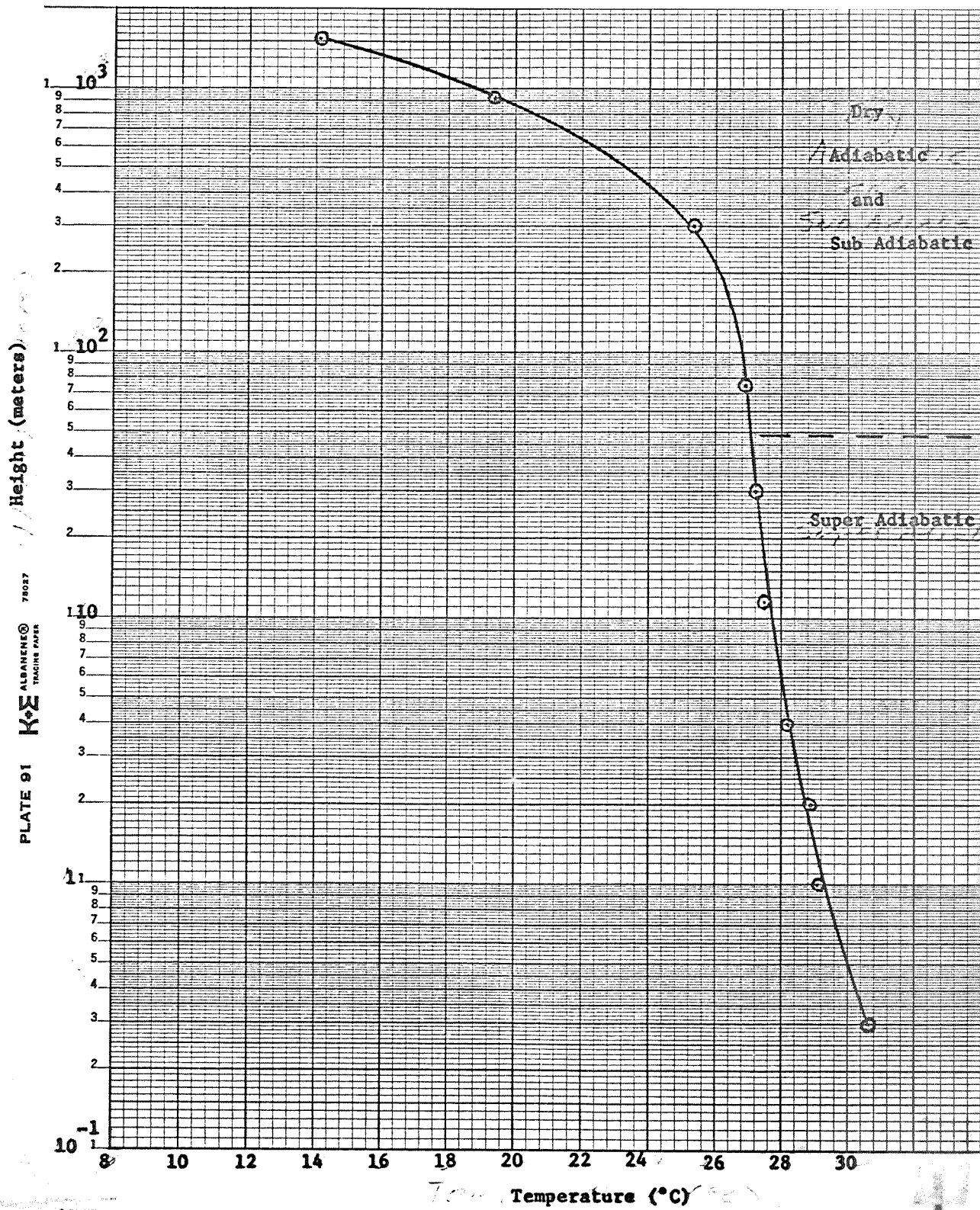
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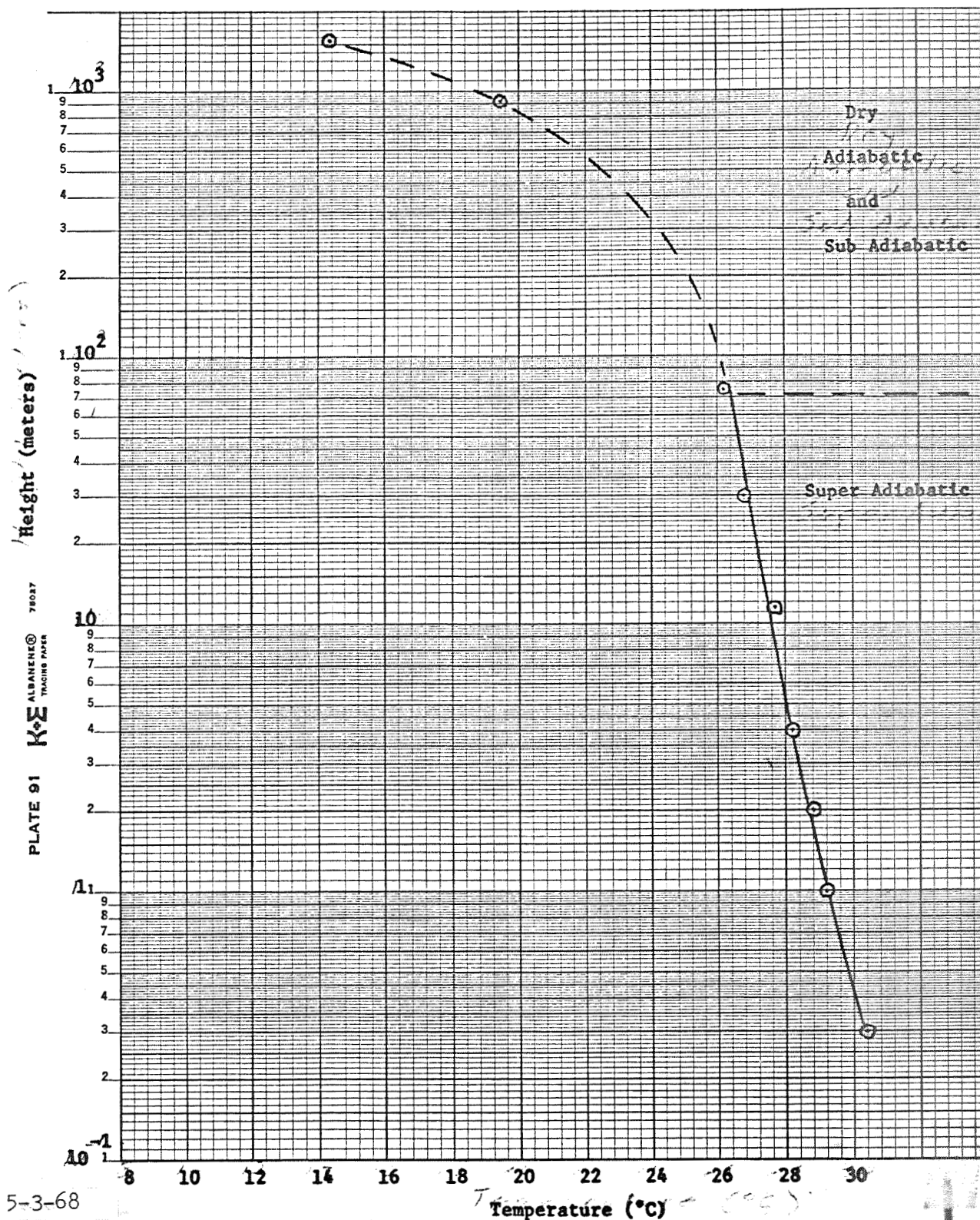
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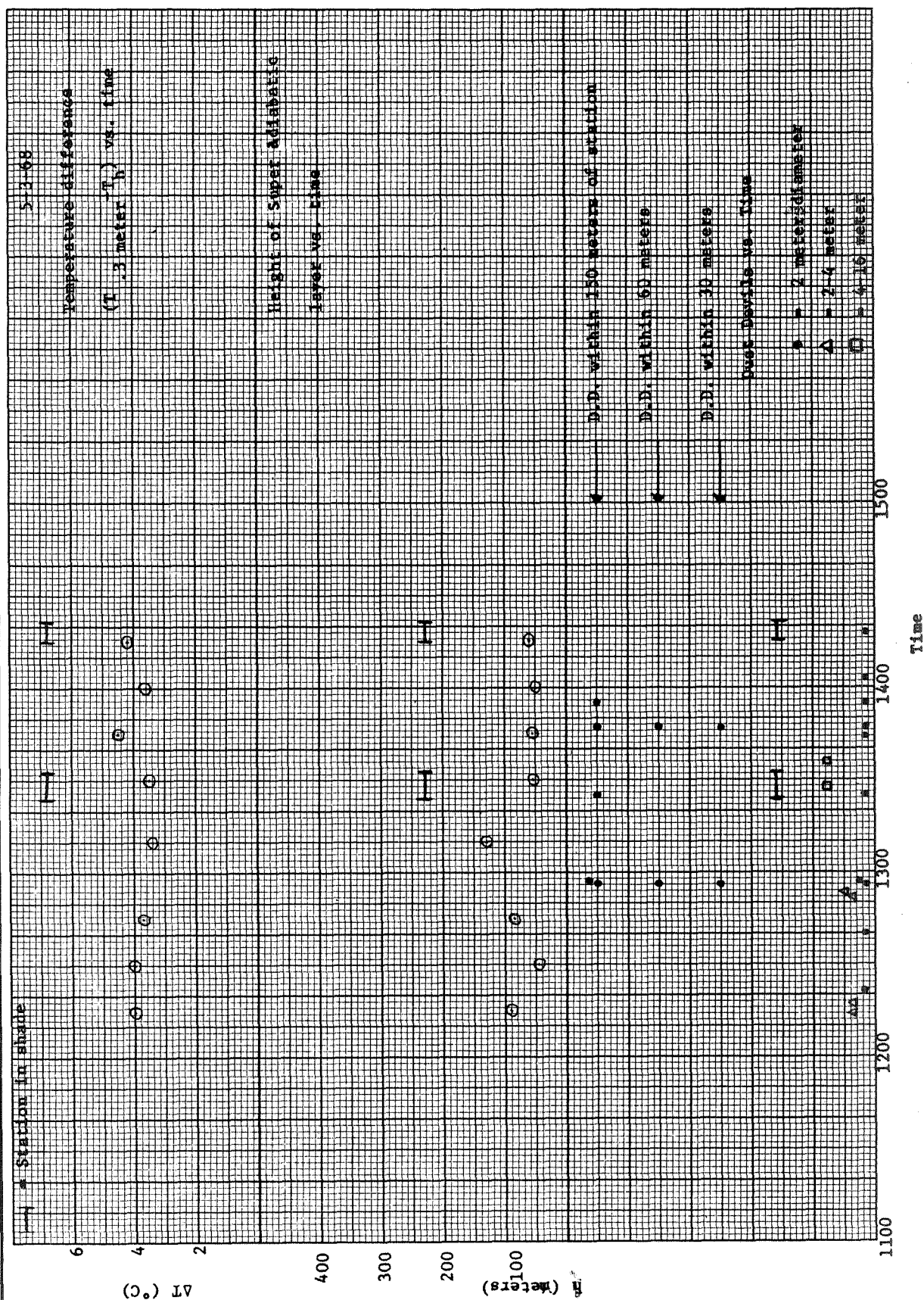


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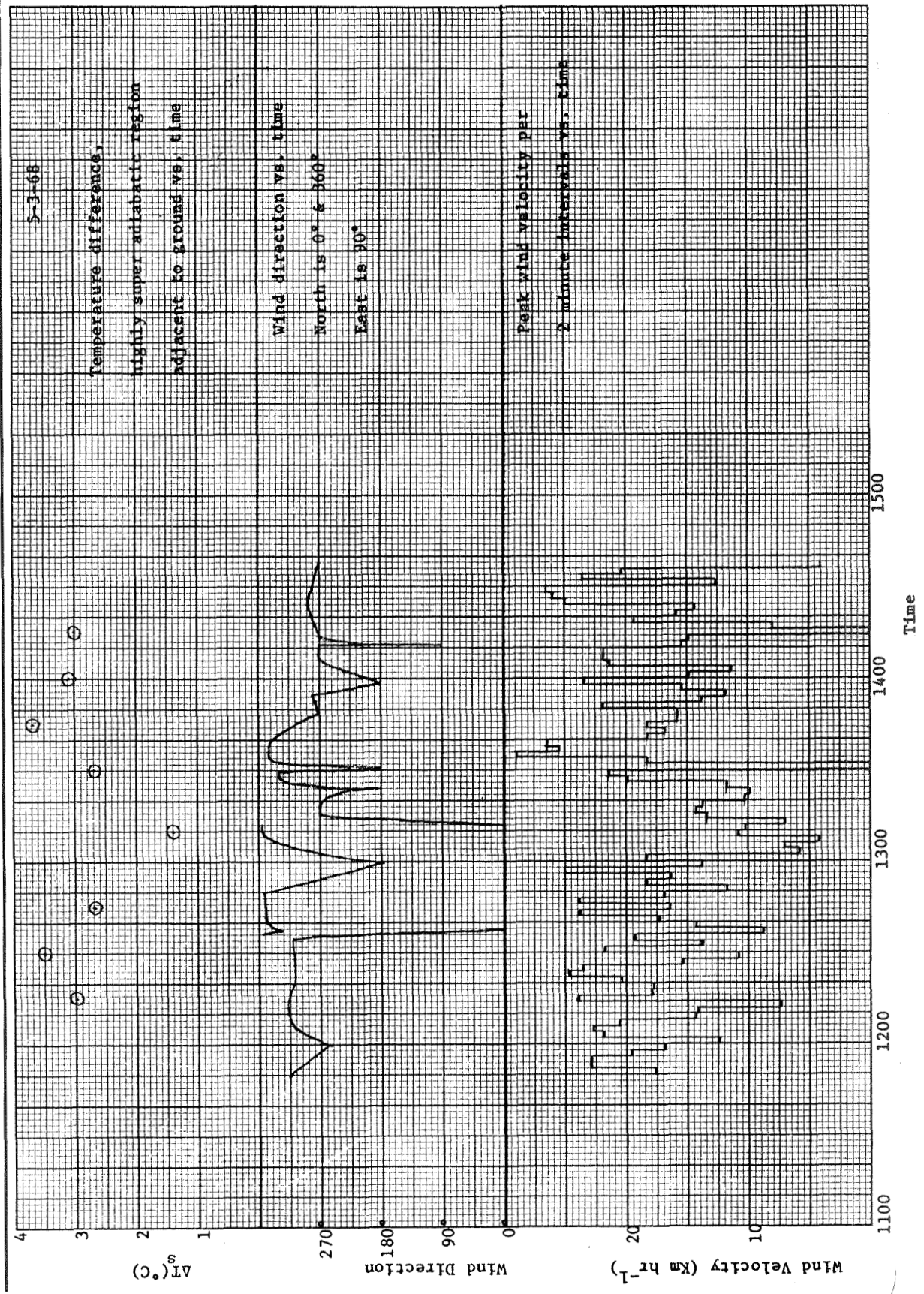
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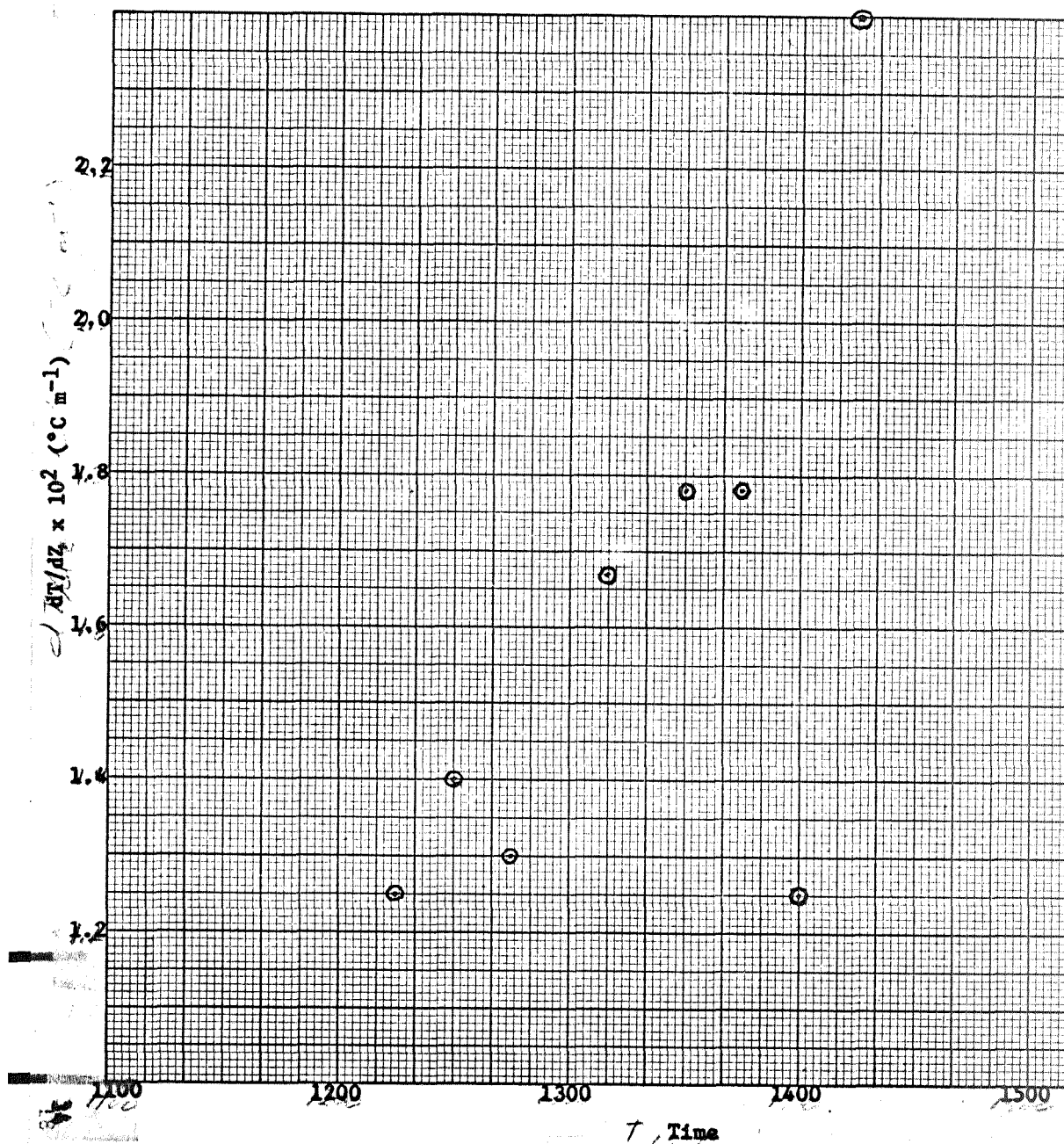


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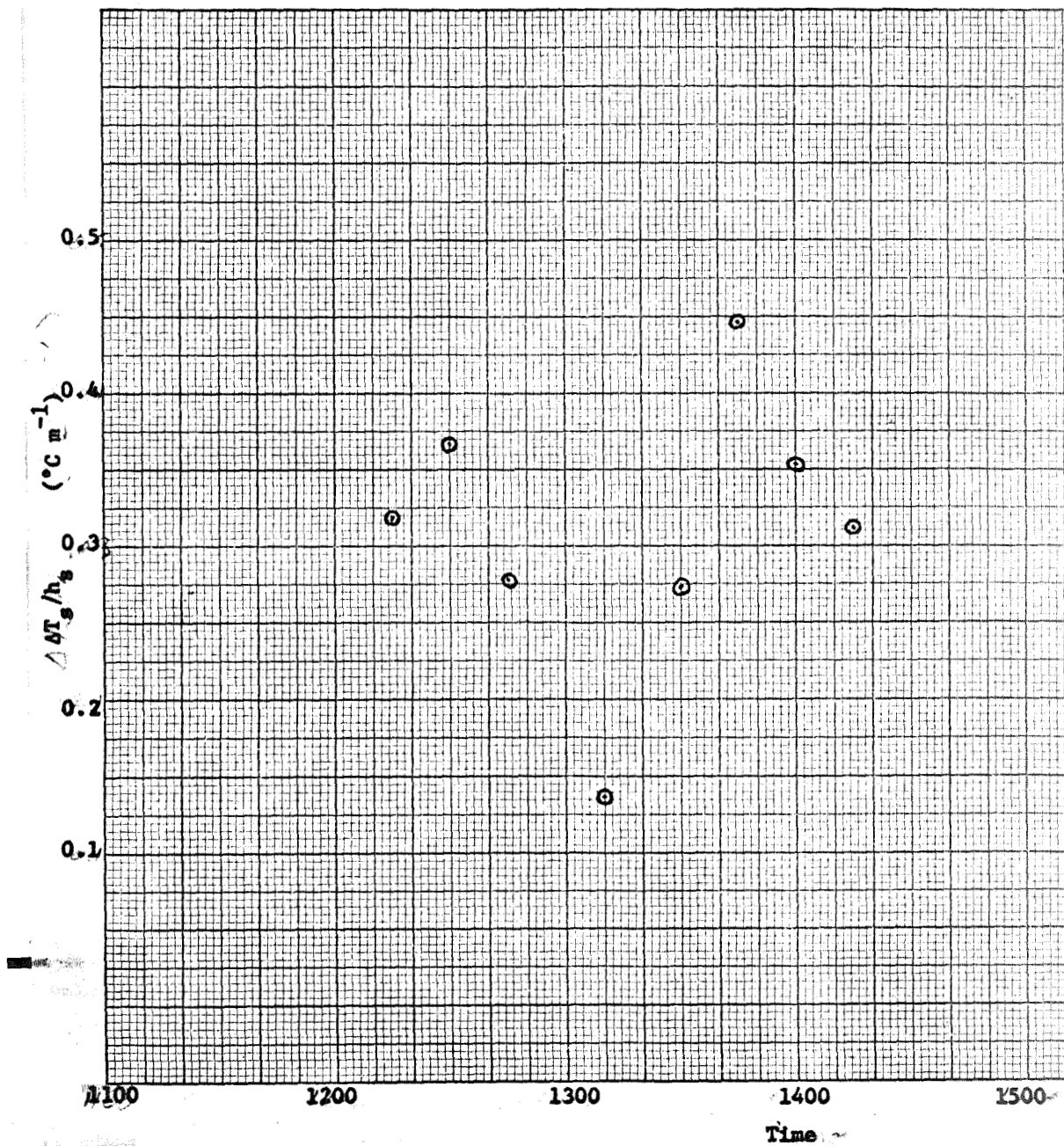
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Lapse Rate (dT/dZ)
vs. Time

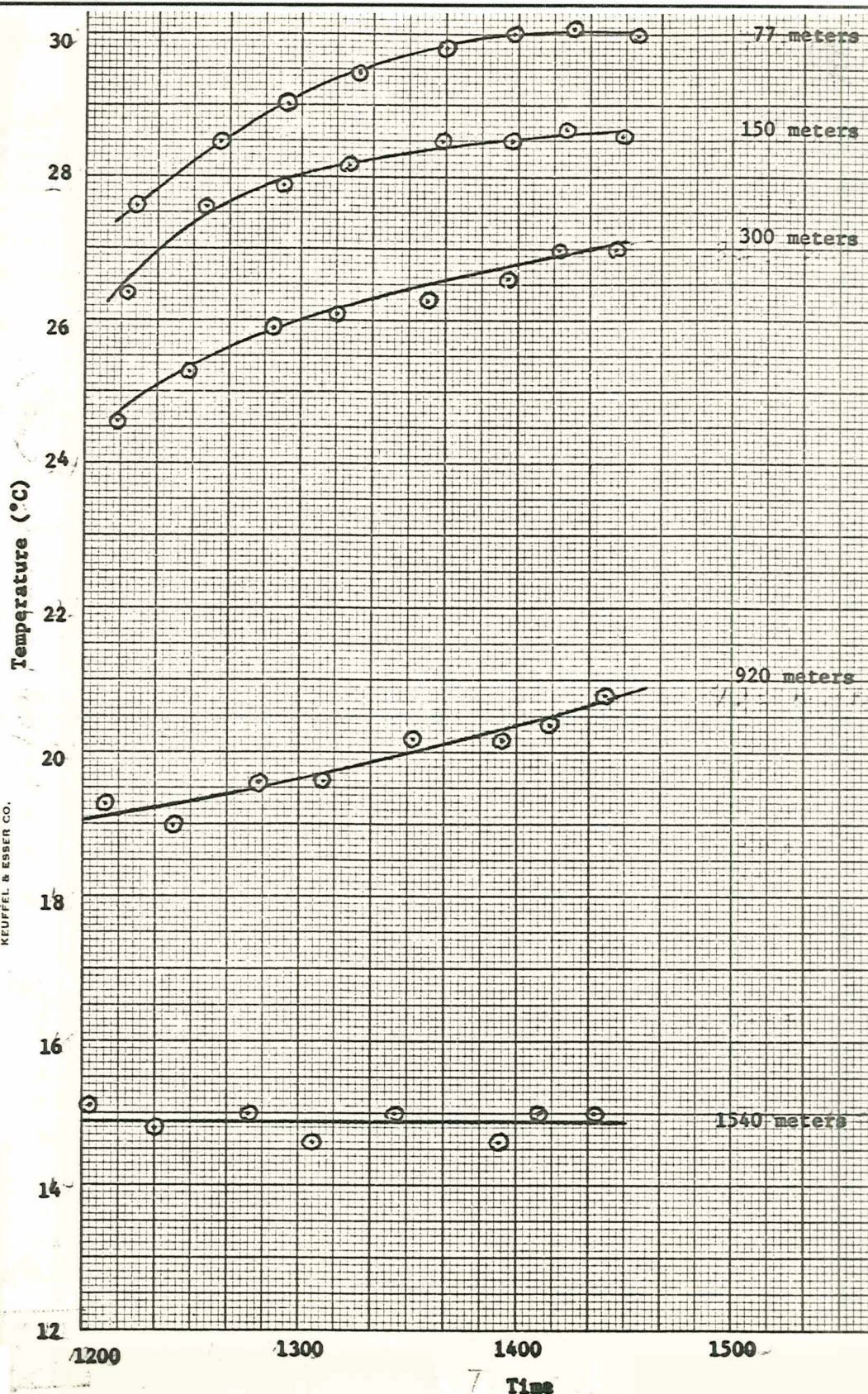


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$\Delta T_s / h_s$ vs. Time

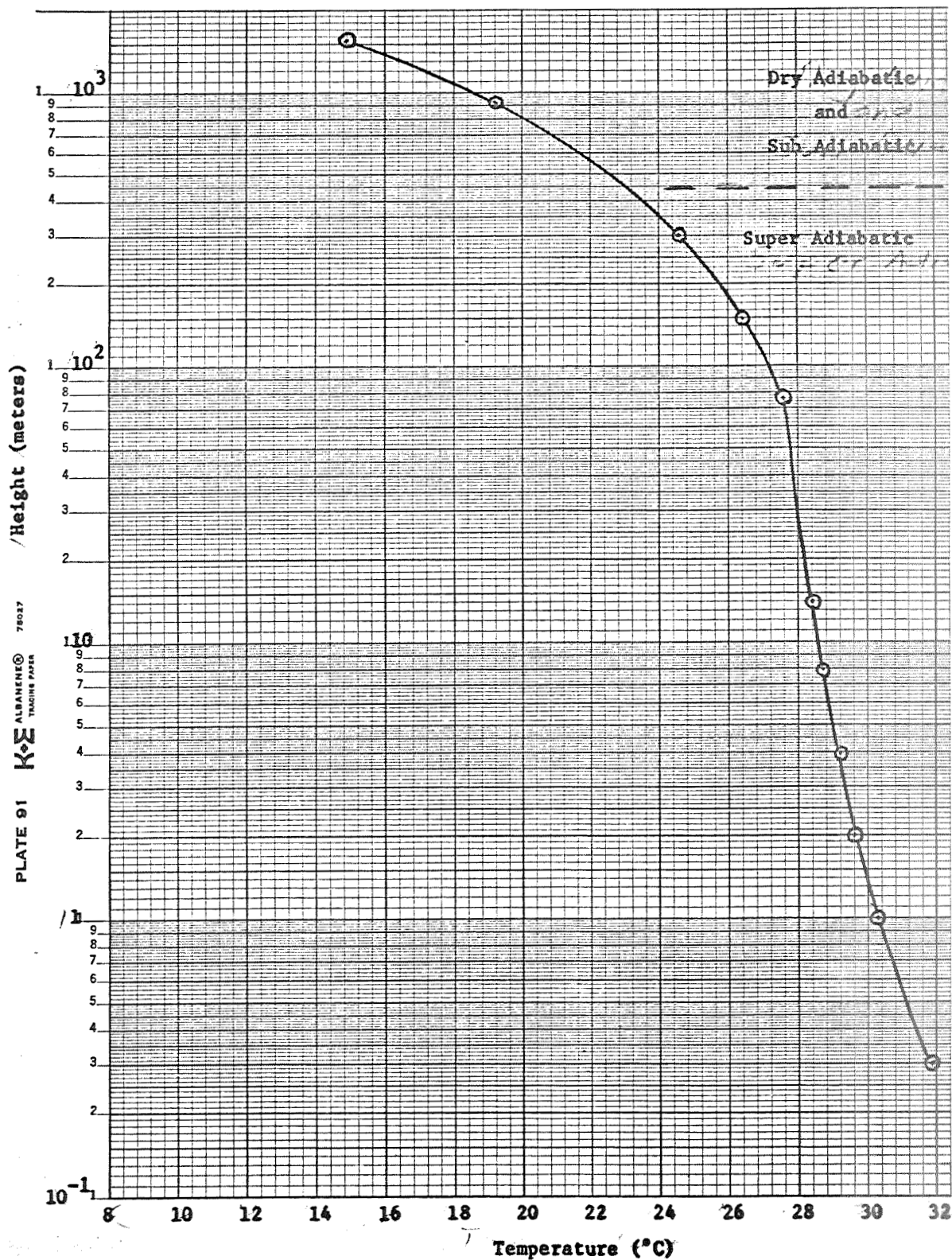
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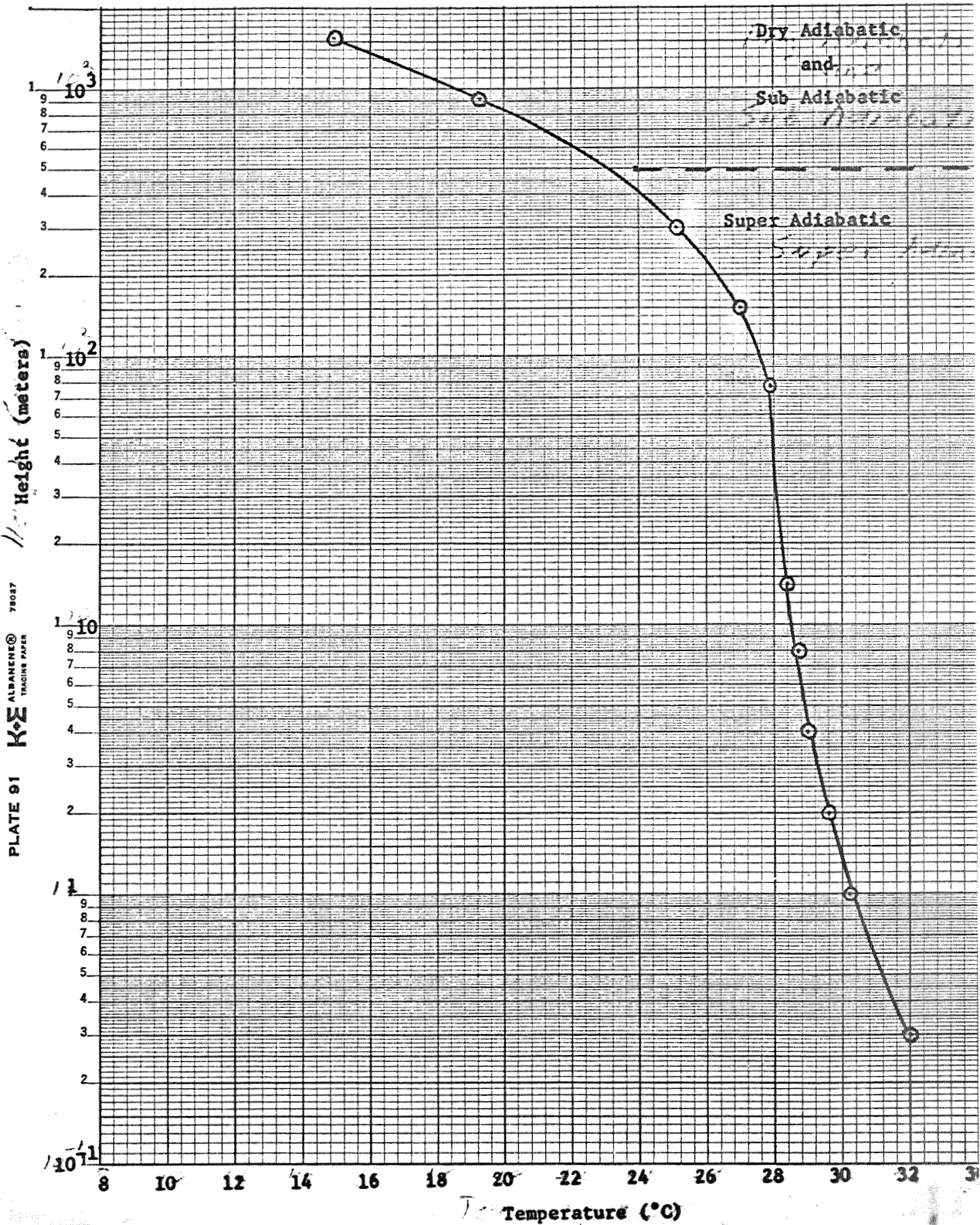
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Aircraft Soundings



6-13-68

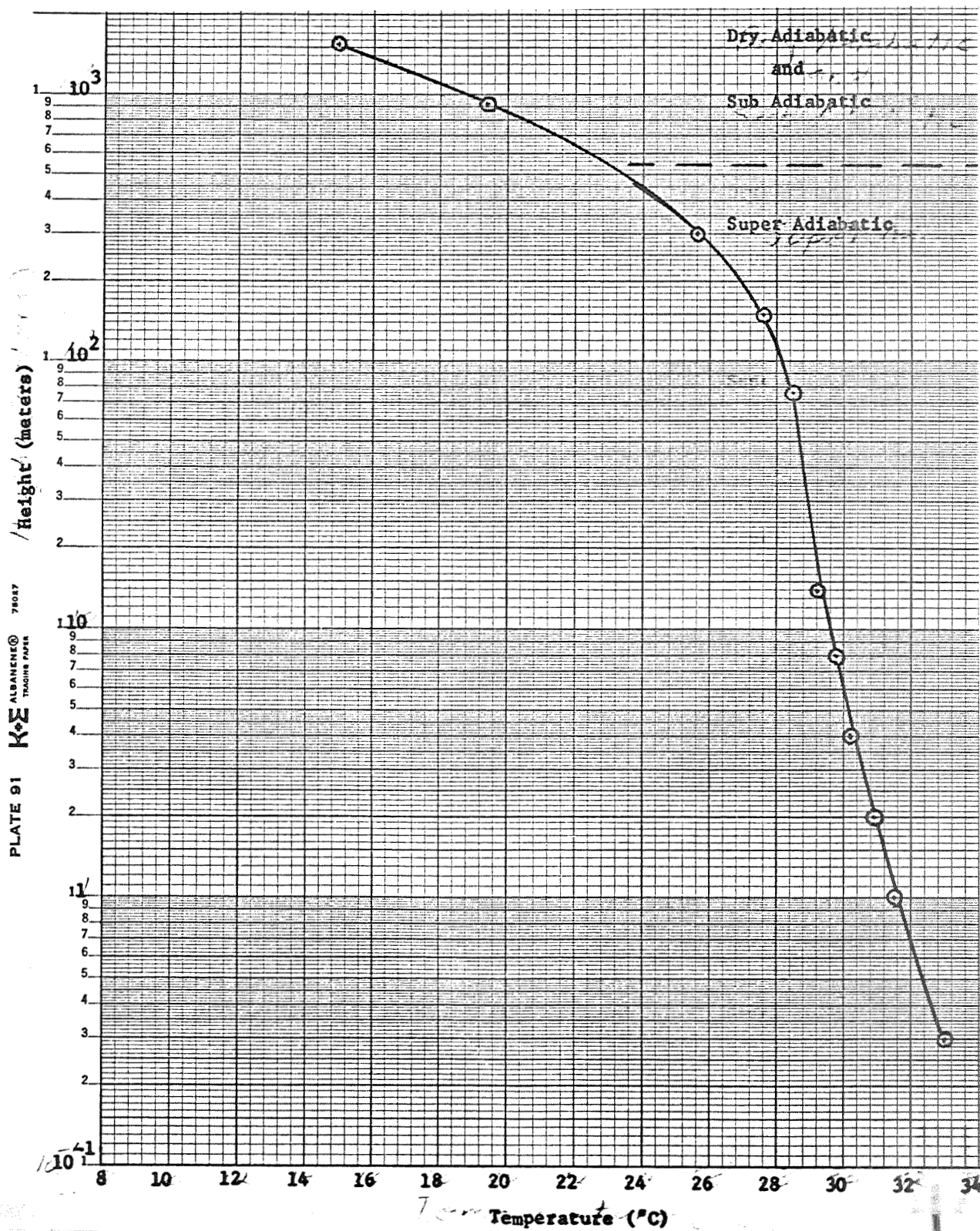
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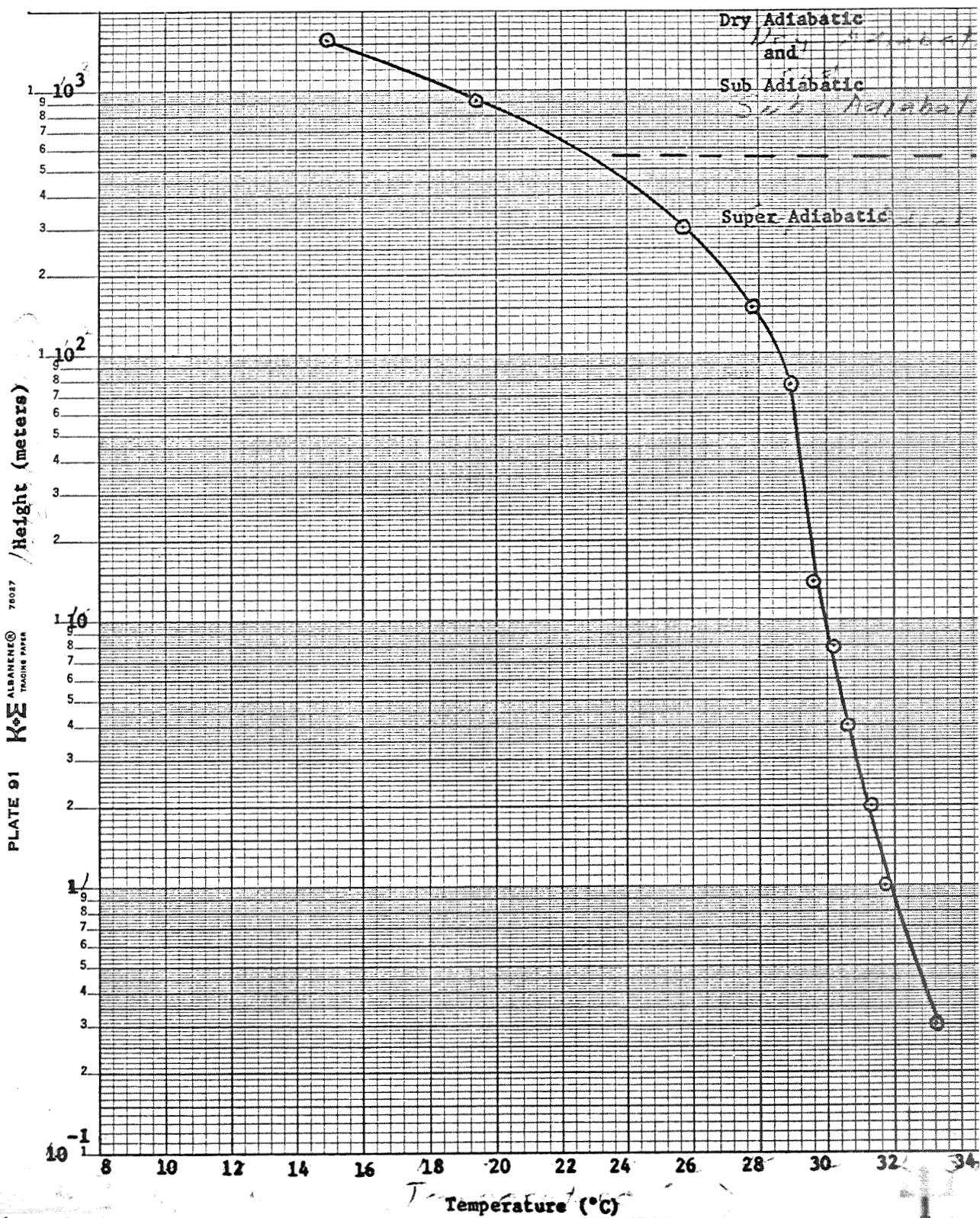
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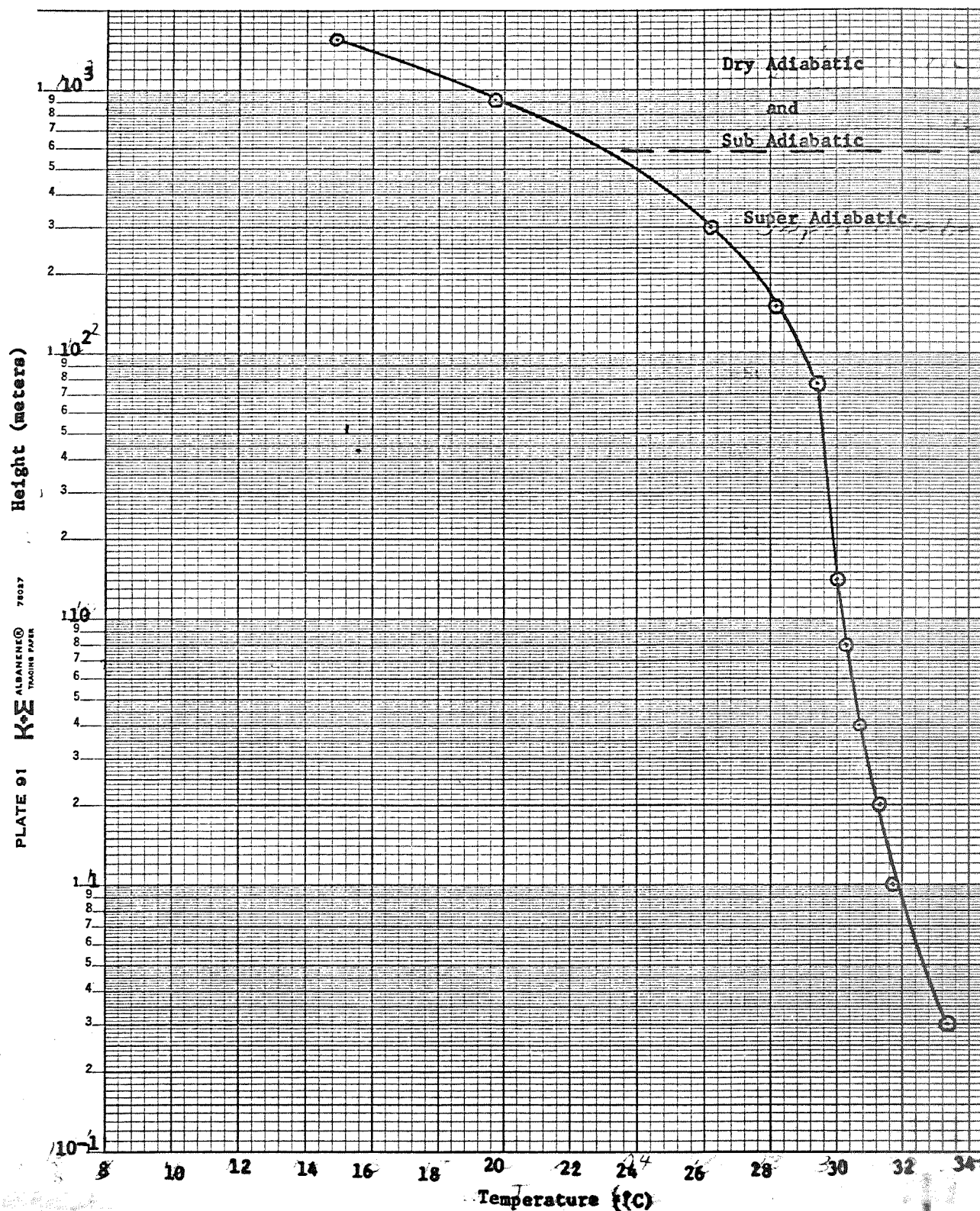
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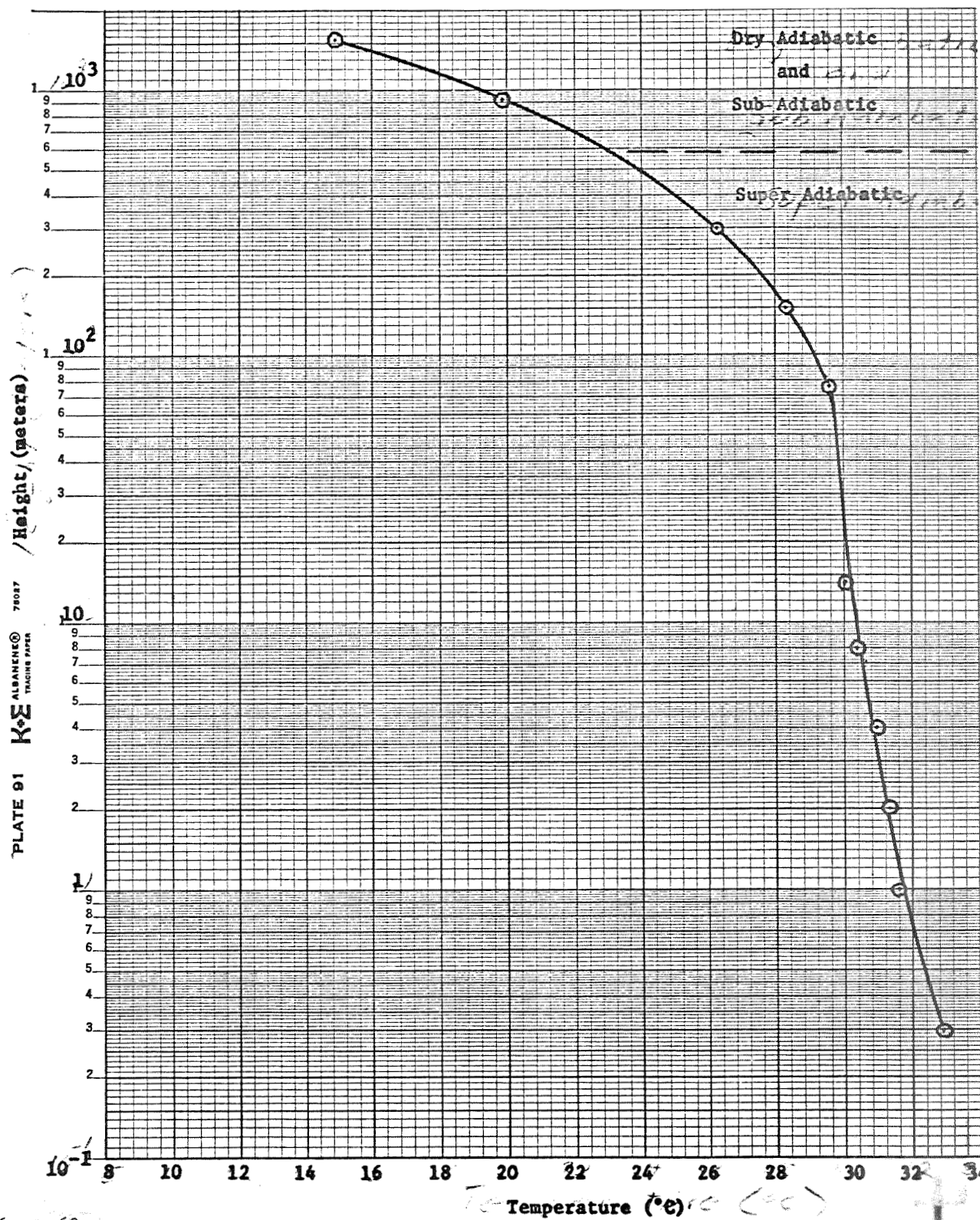
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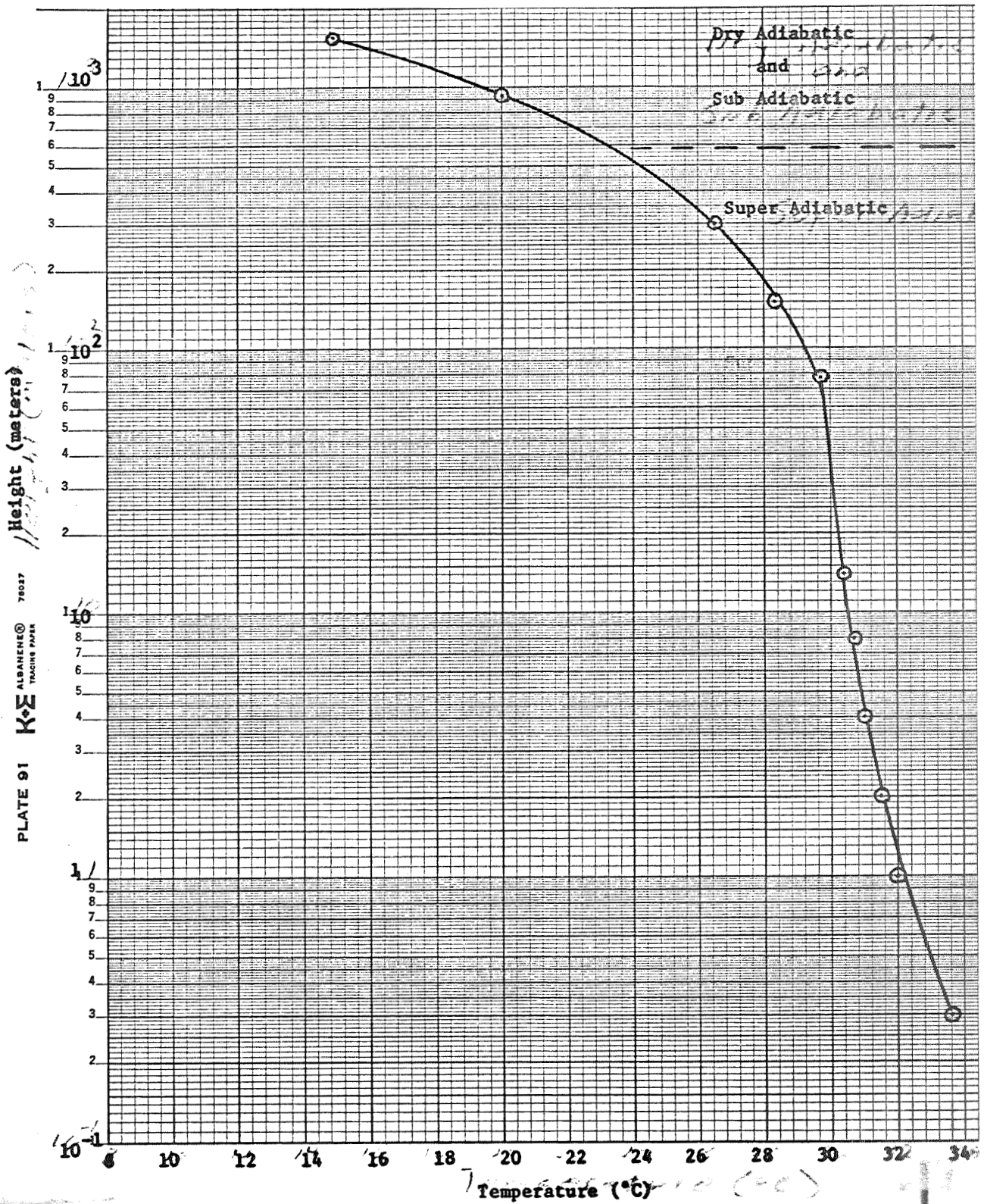
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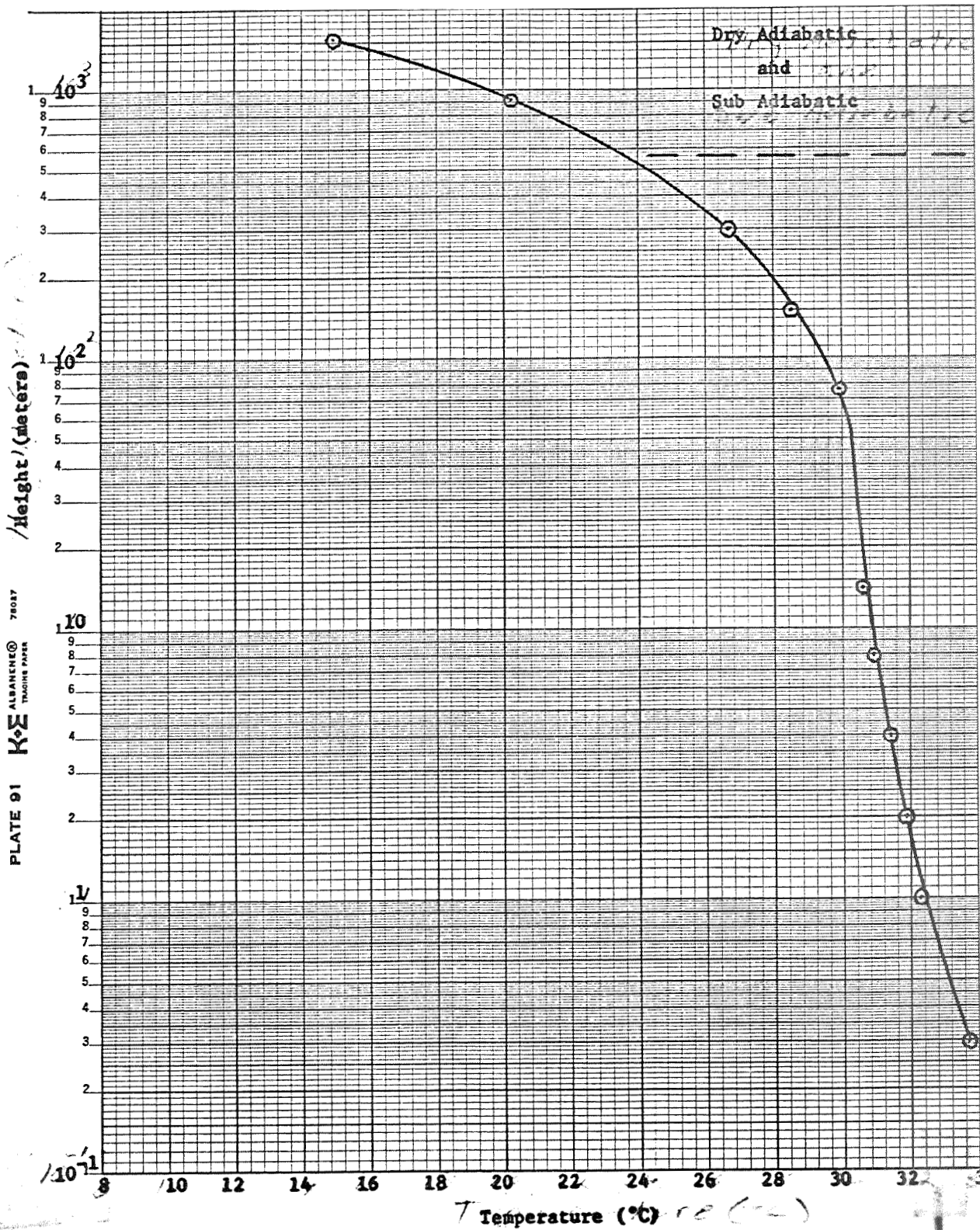
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M 30-692-6 (8-68)



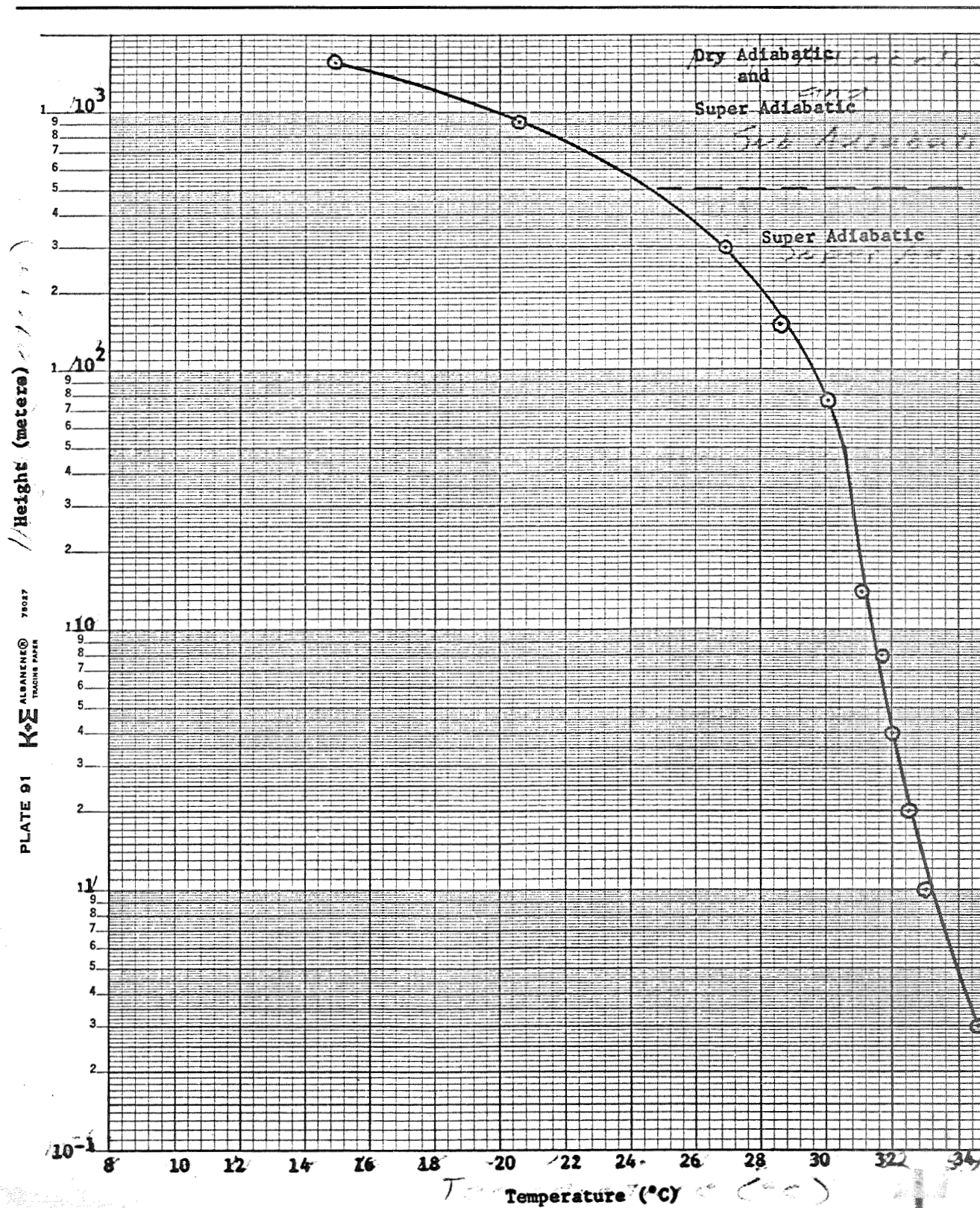
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6-13-68

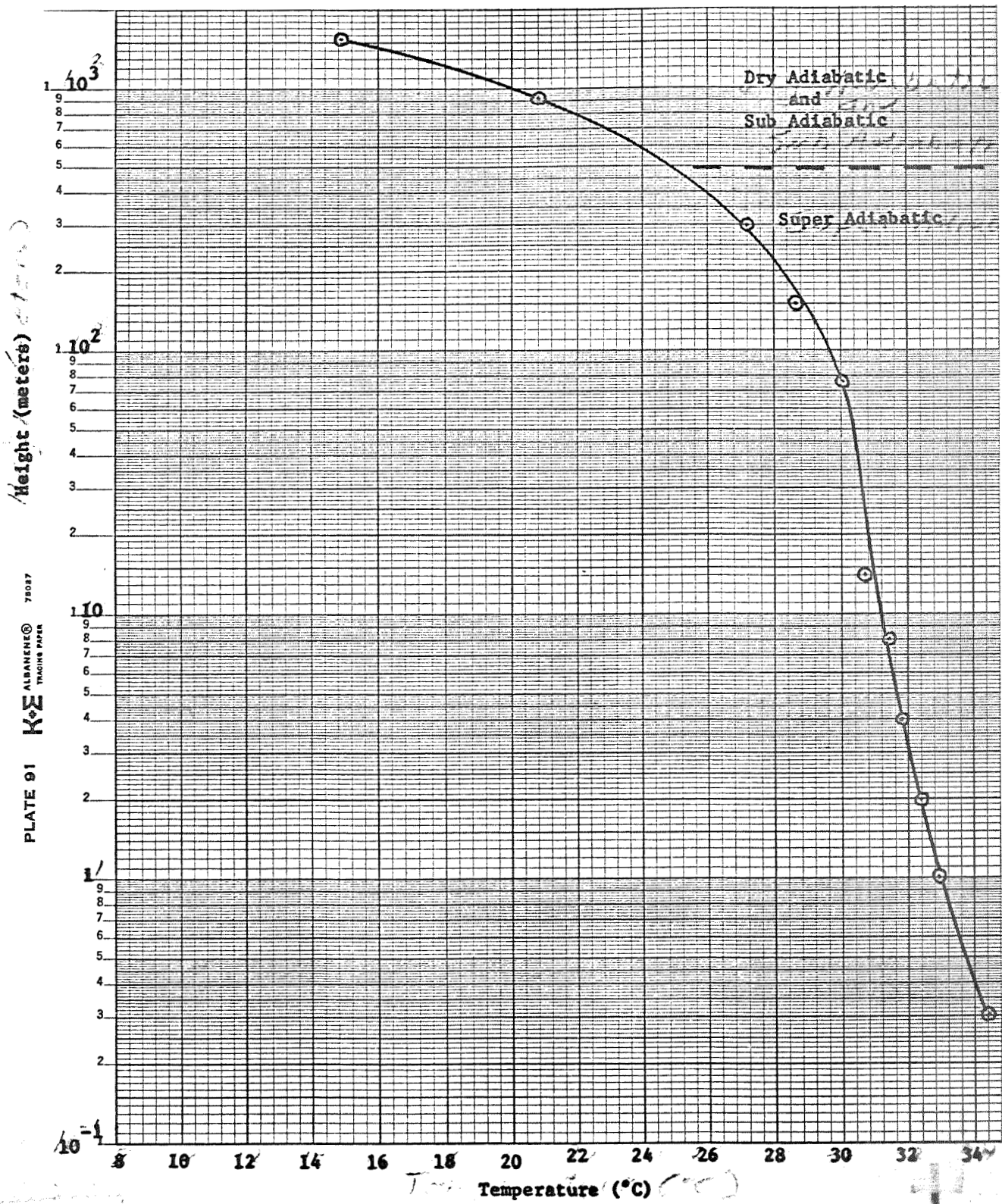
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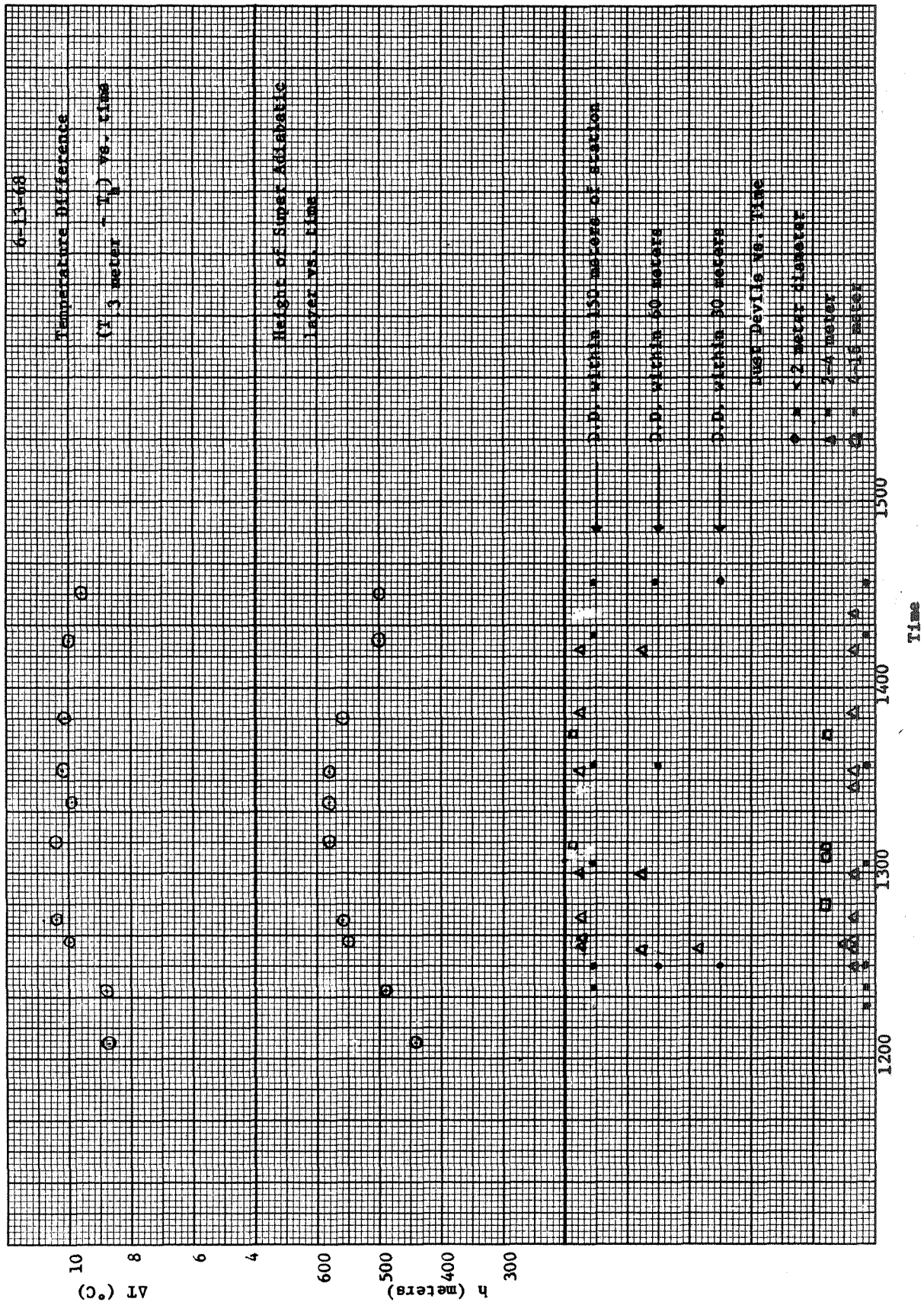
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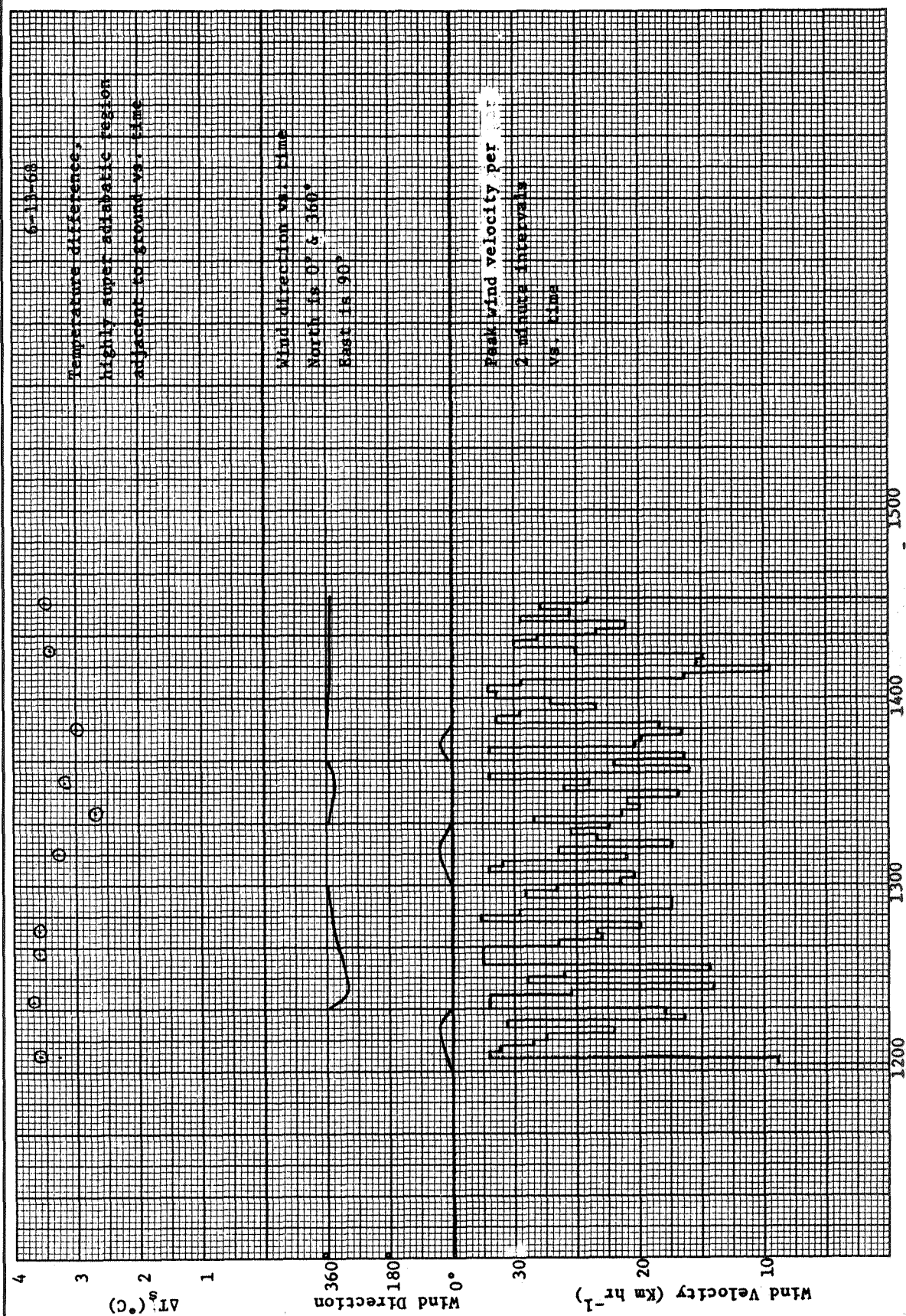
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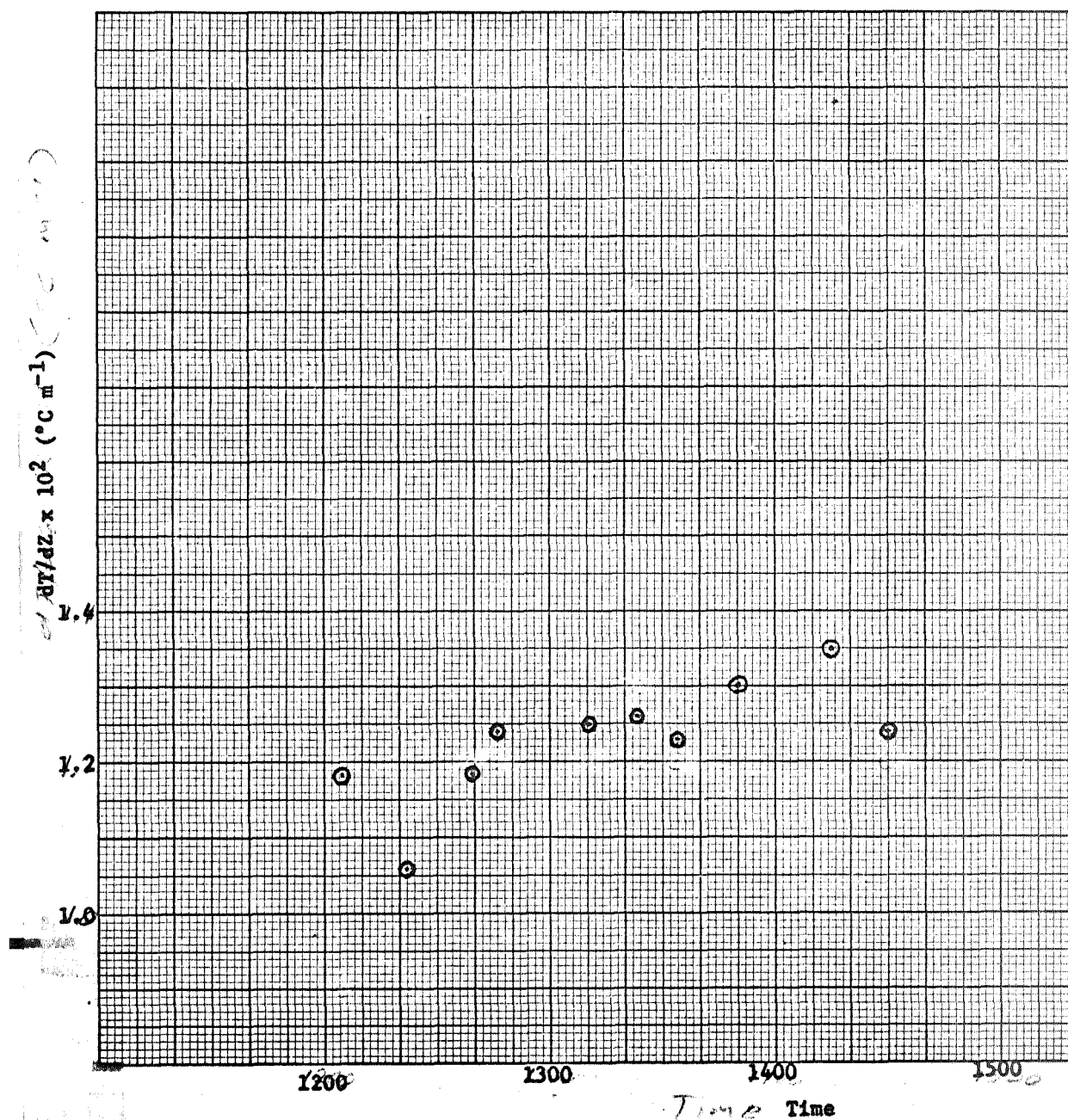


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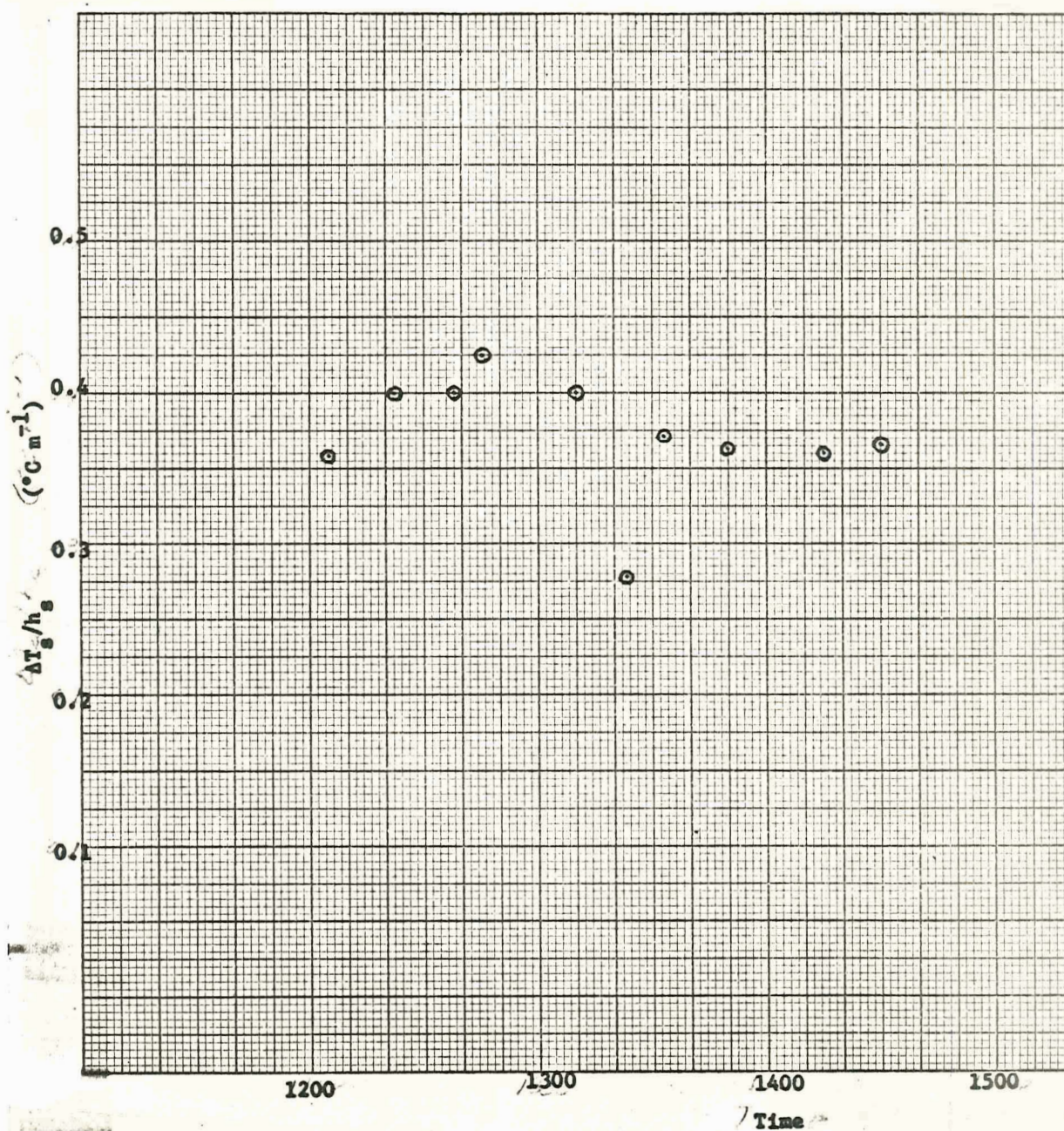




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Lapse Rate ($\frac{dT}{dZ}$)

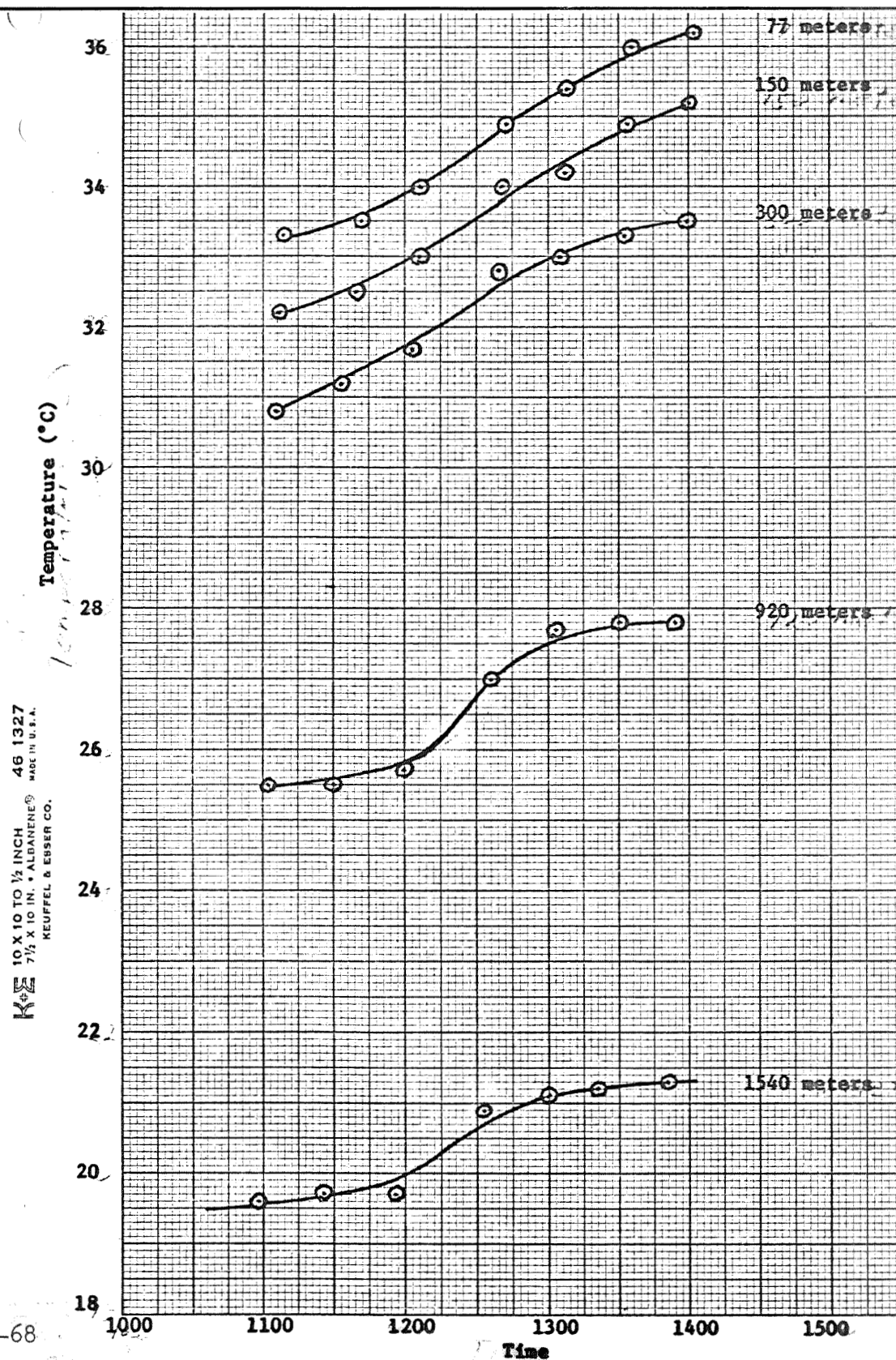
vs. Time



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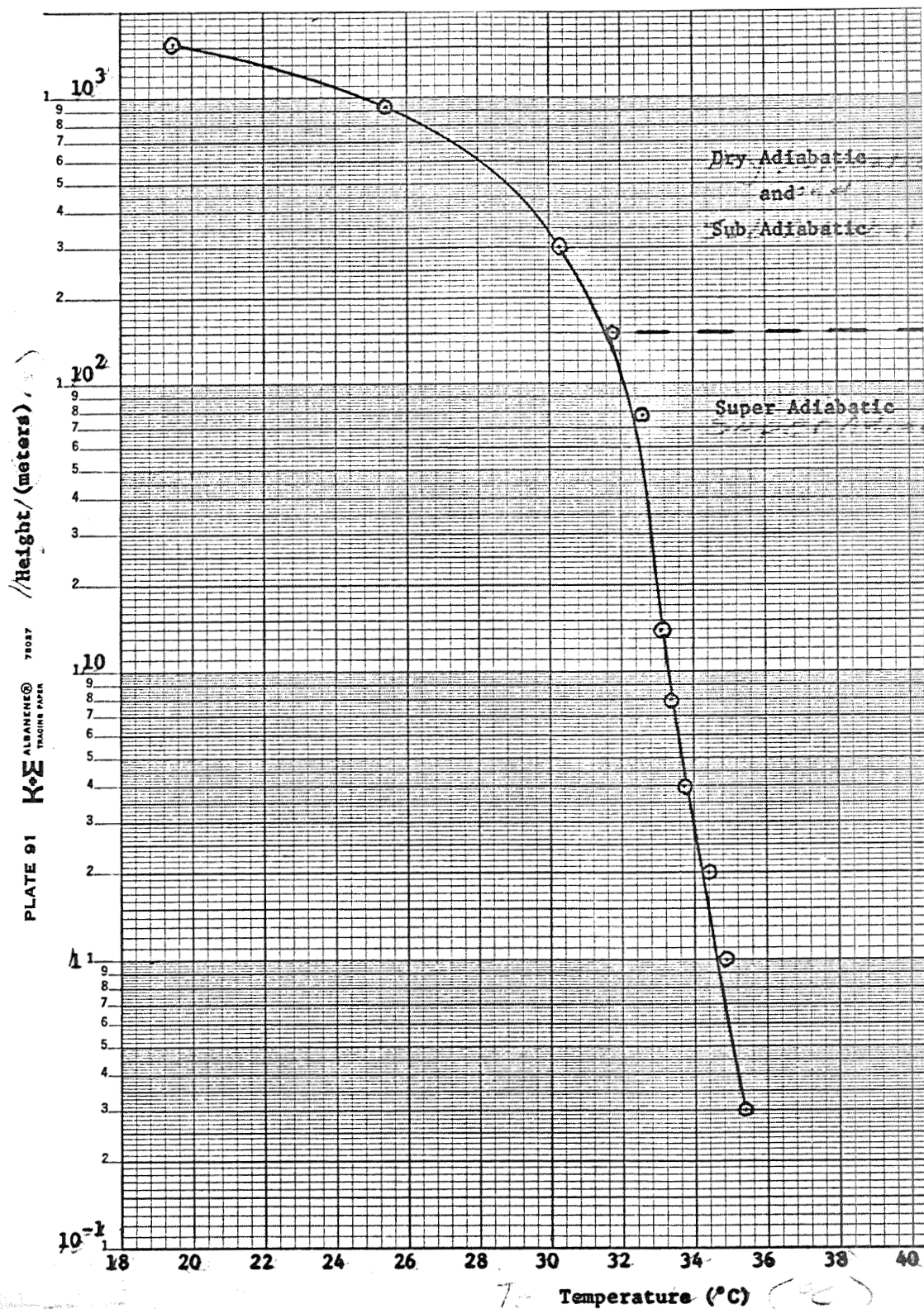
$\Delta T_s/h_s$ vs. Time

DATA FOR 6-26-68



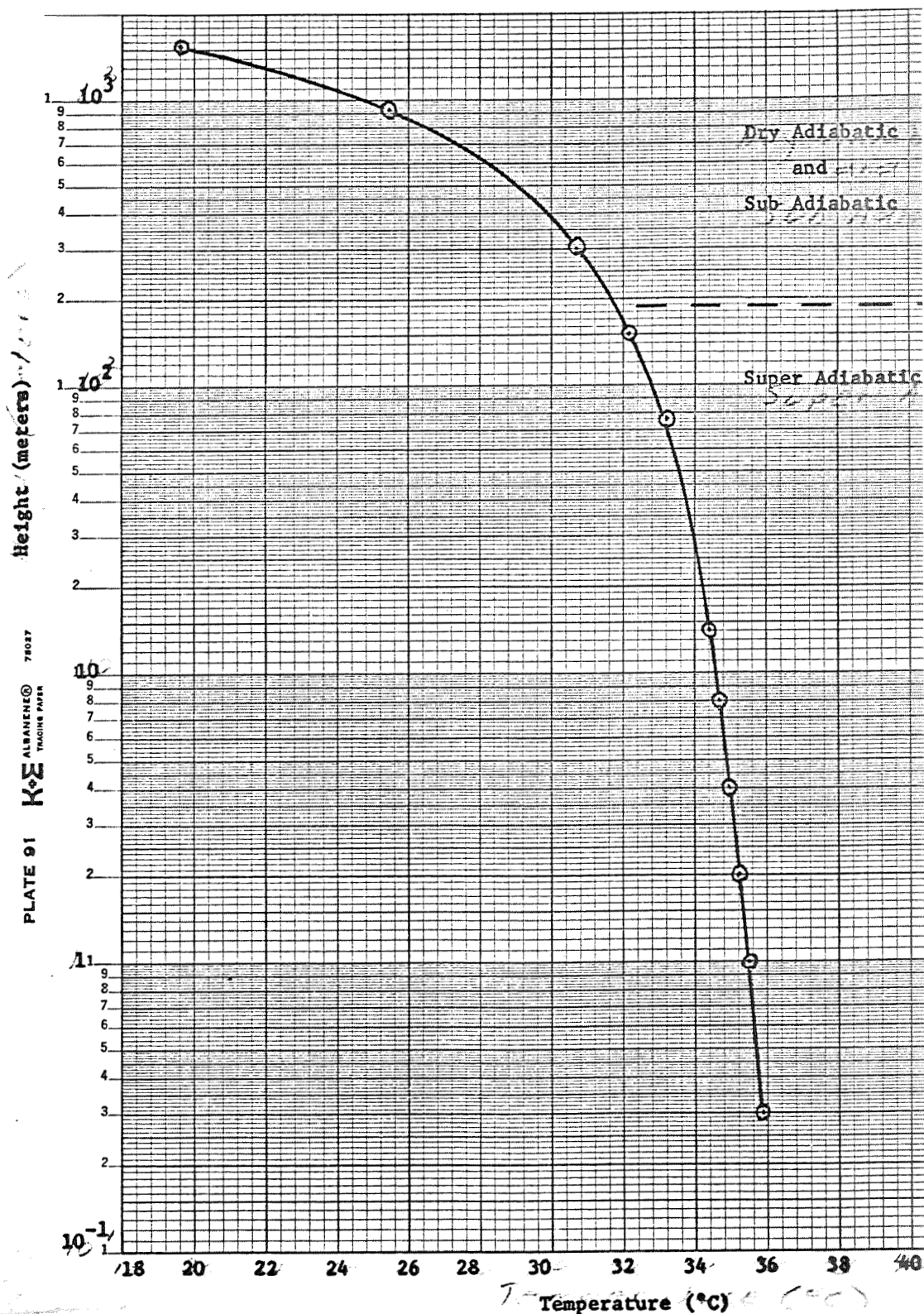
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Aircraft Soundings



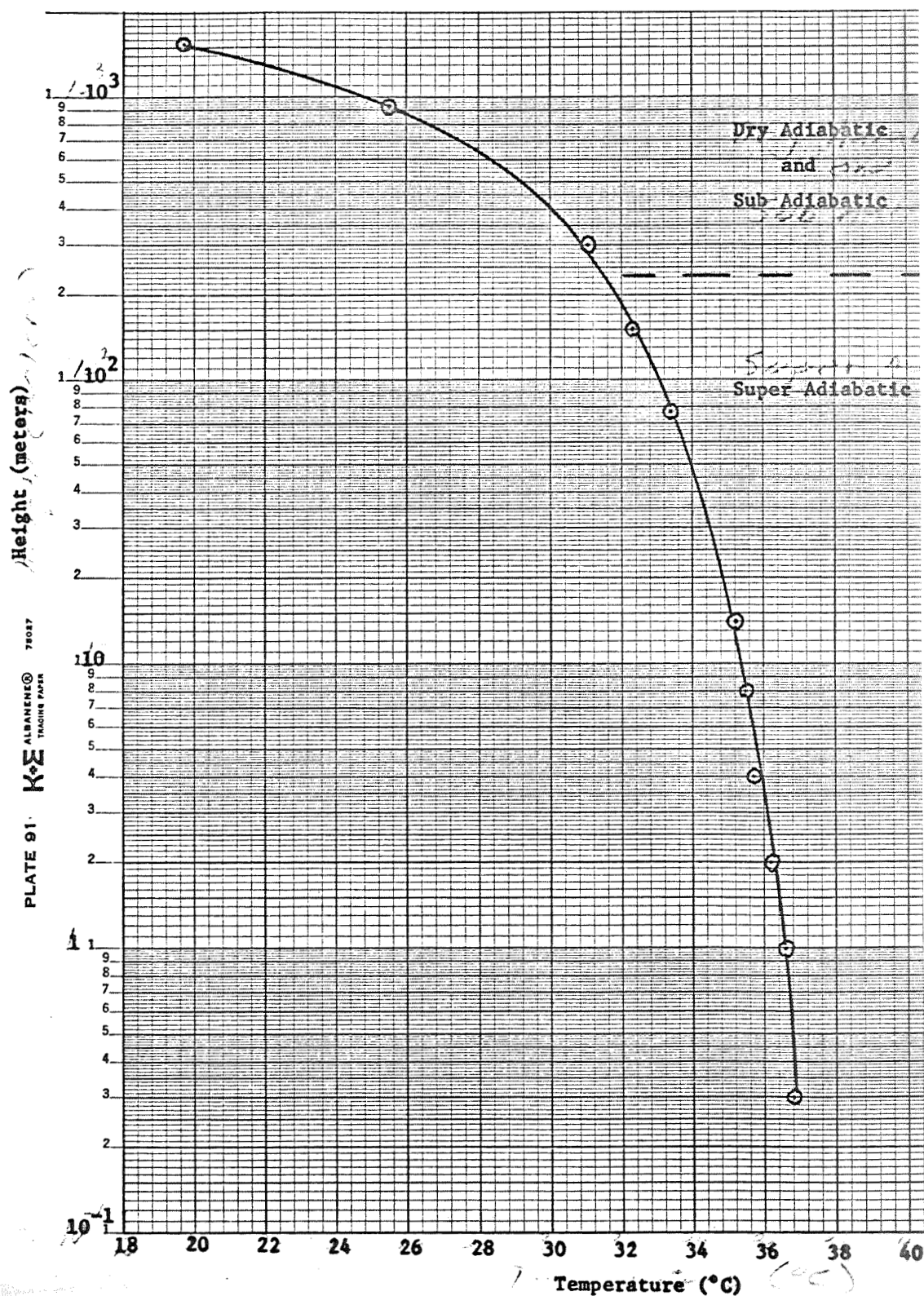
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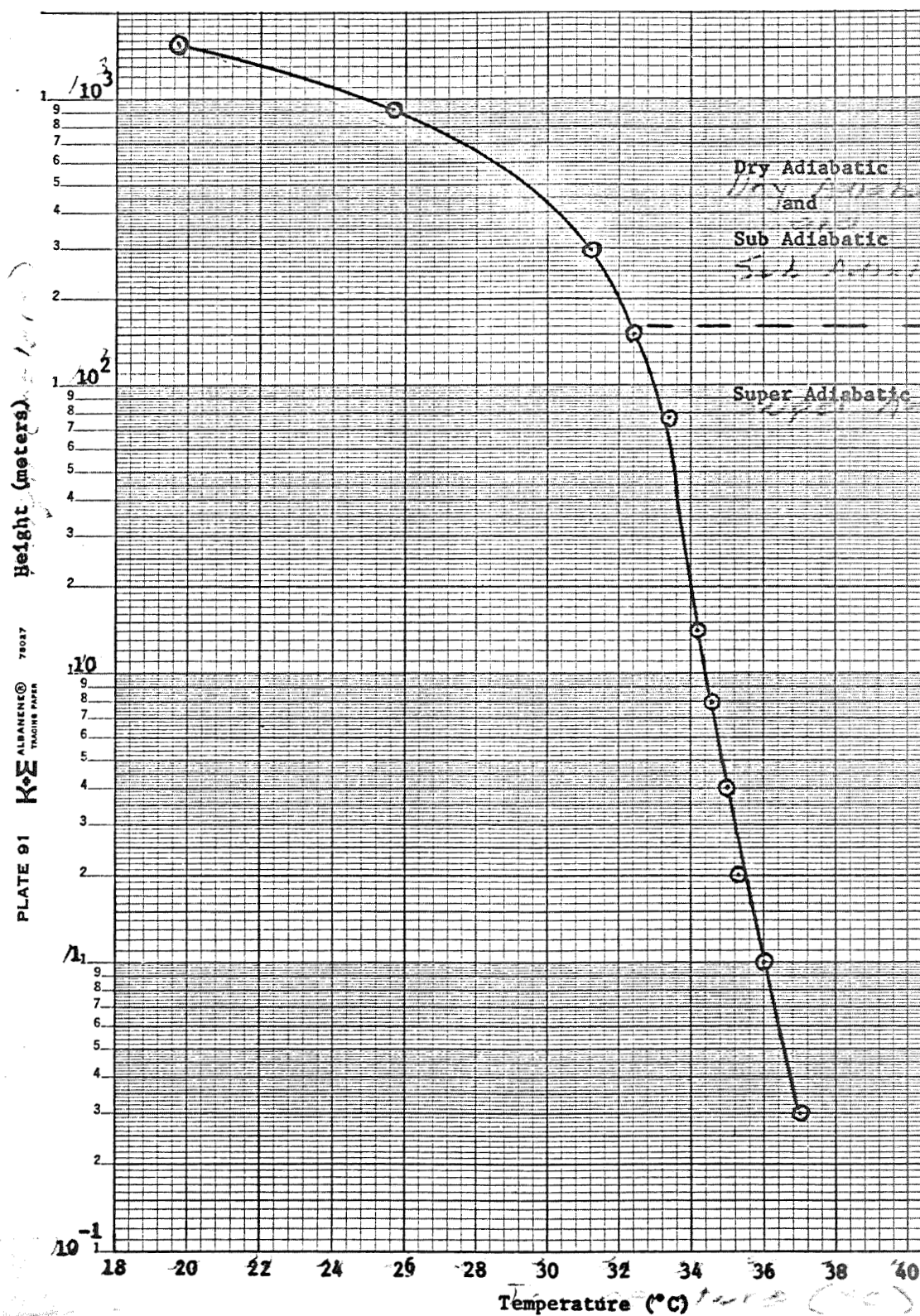
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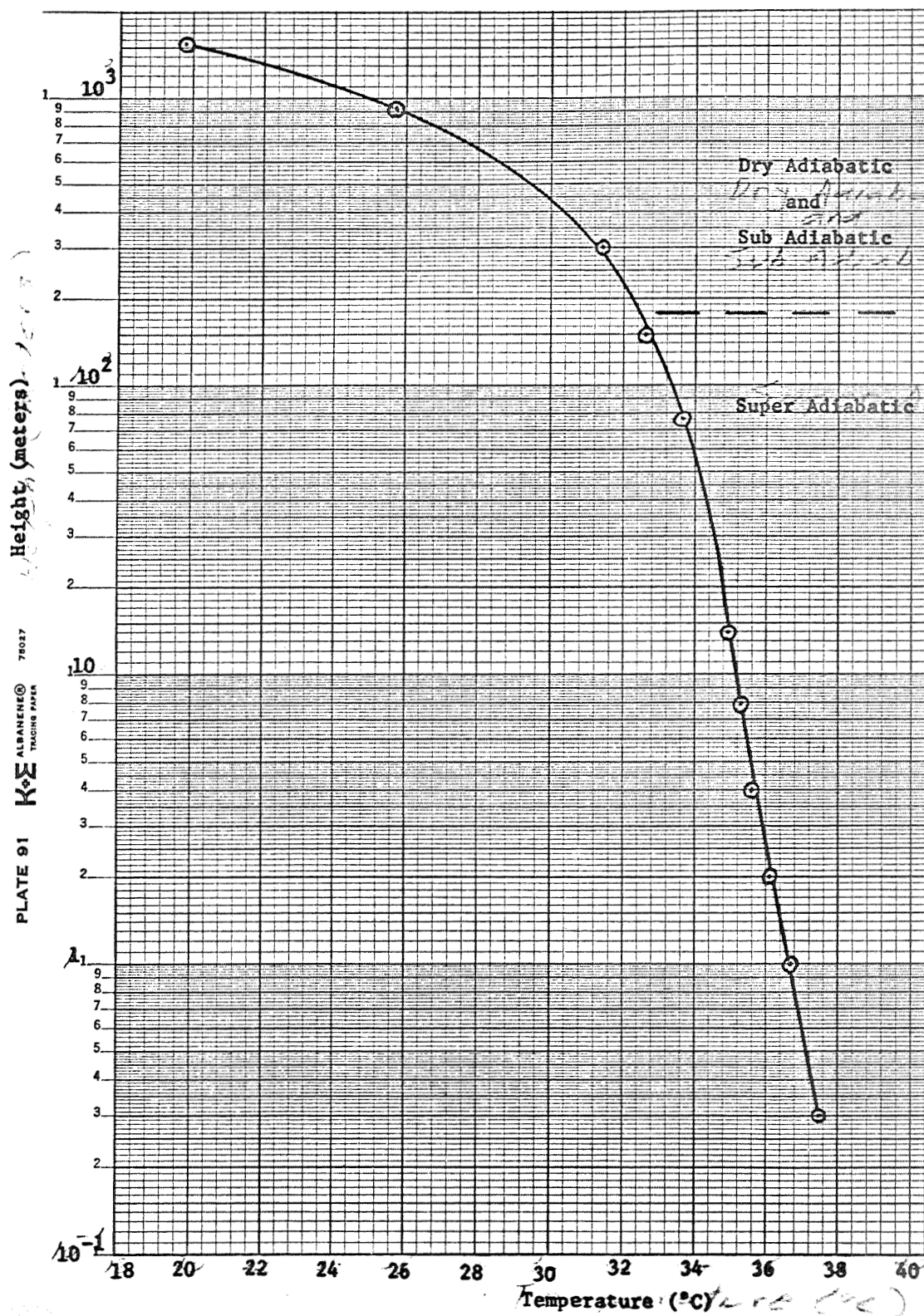
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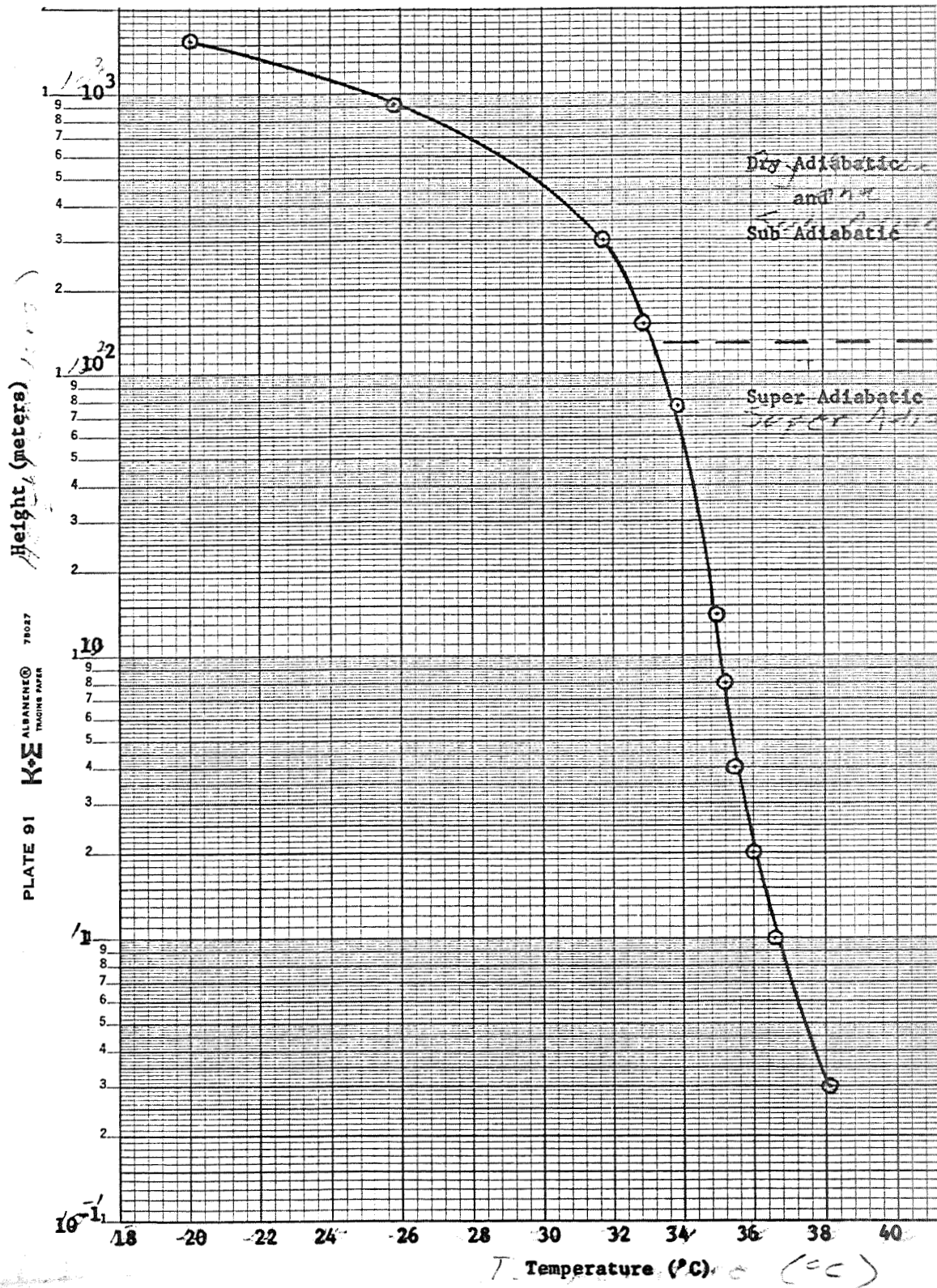
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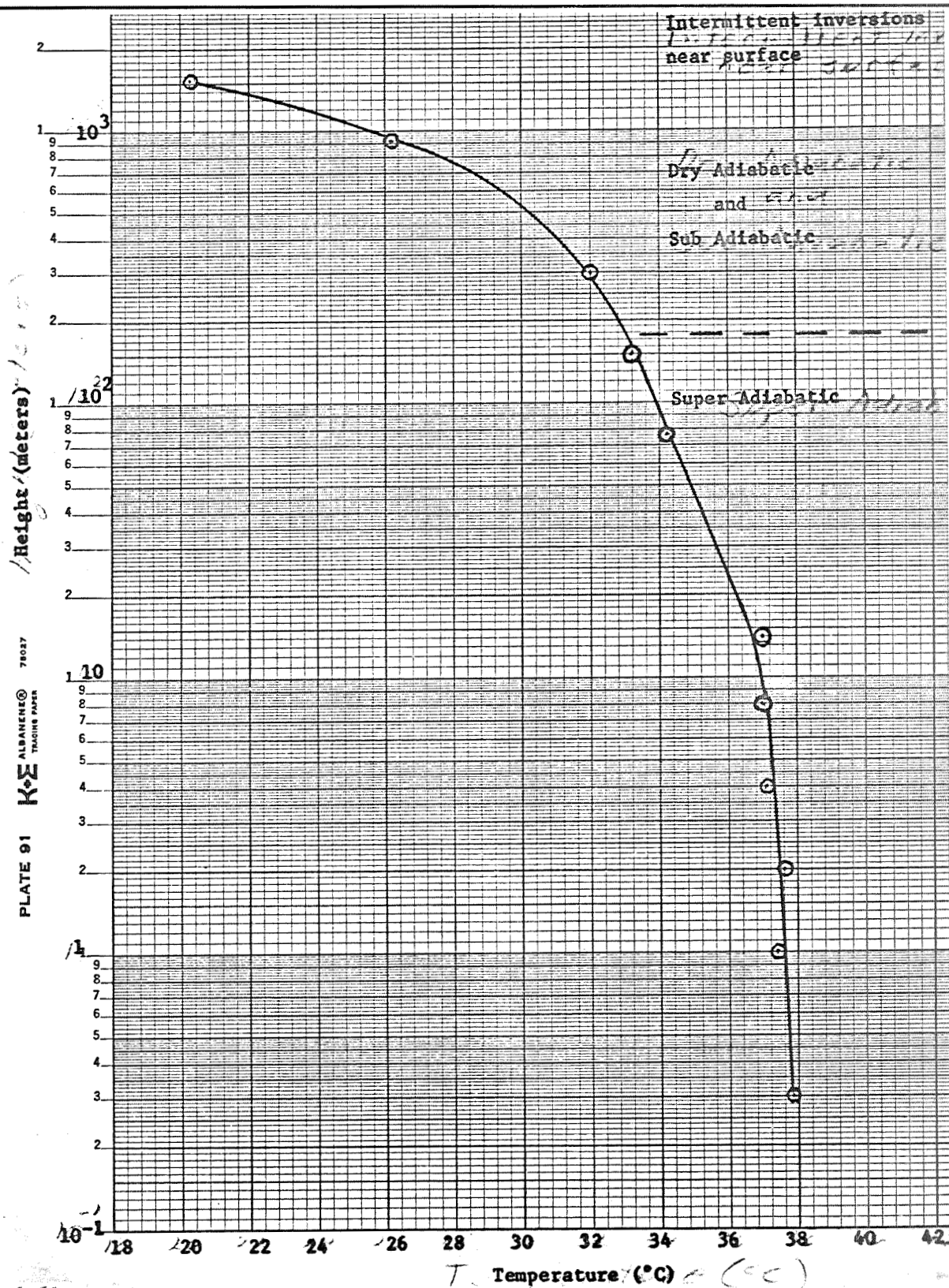
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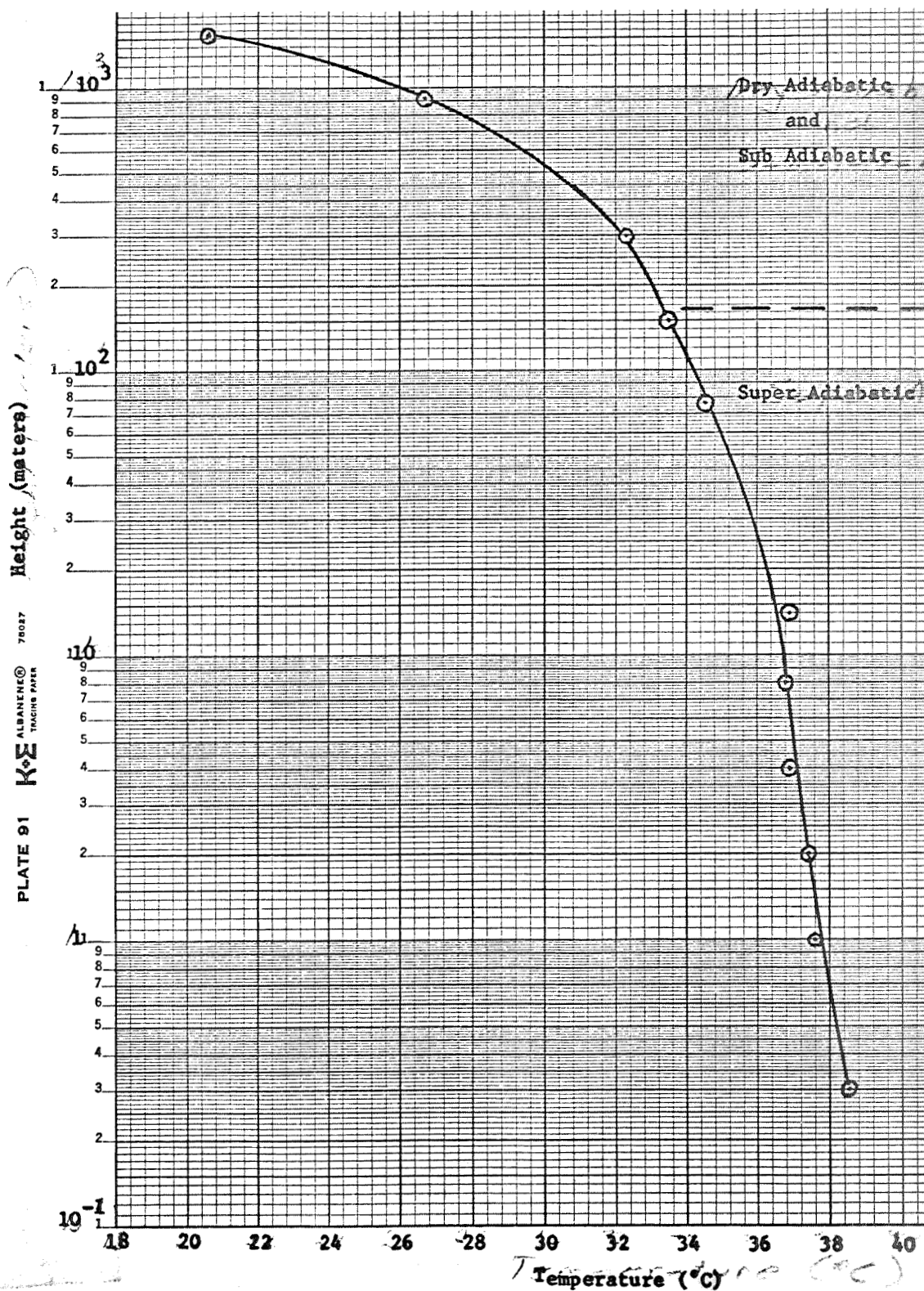
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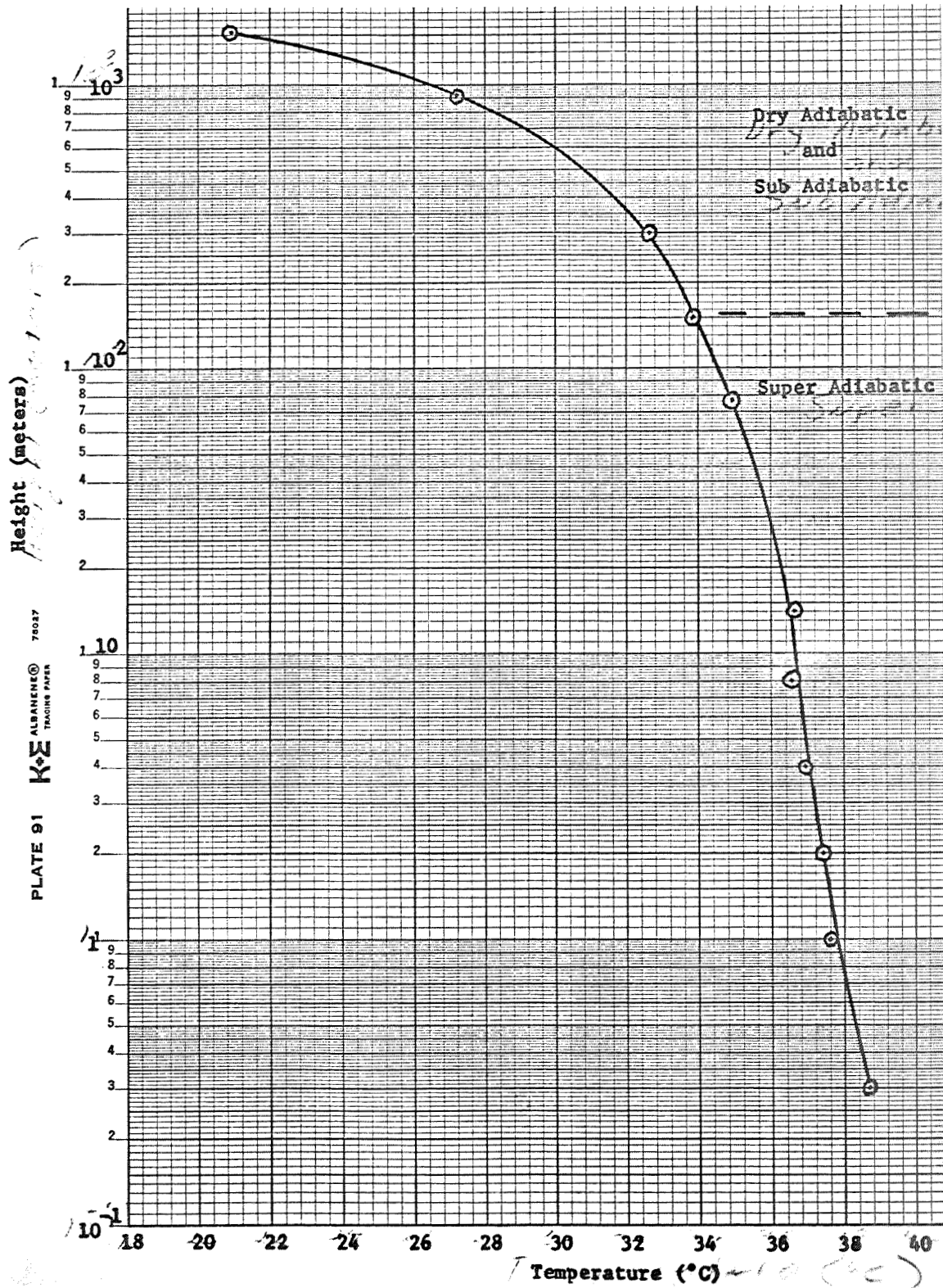
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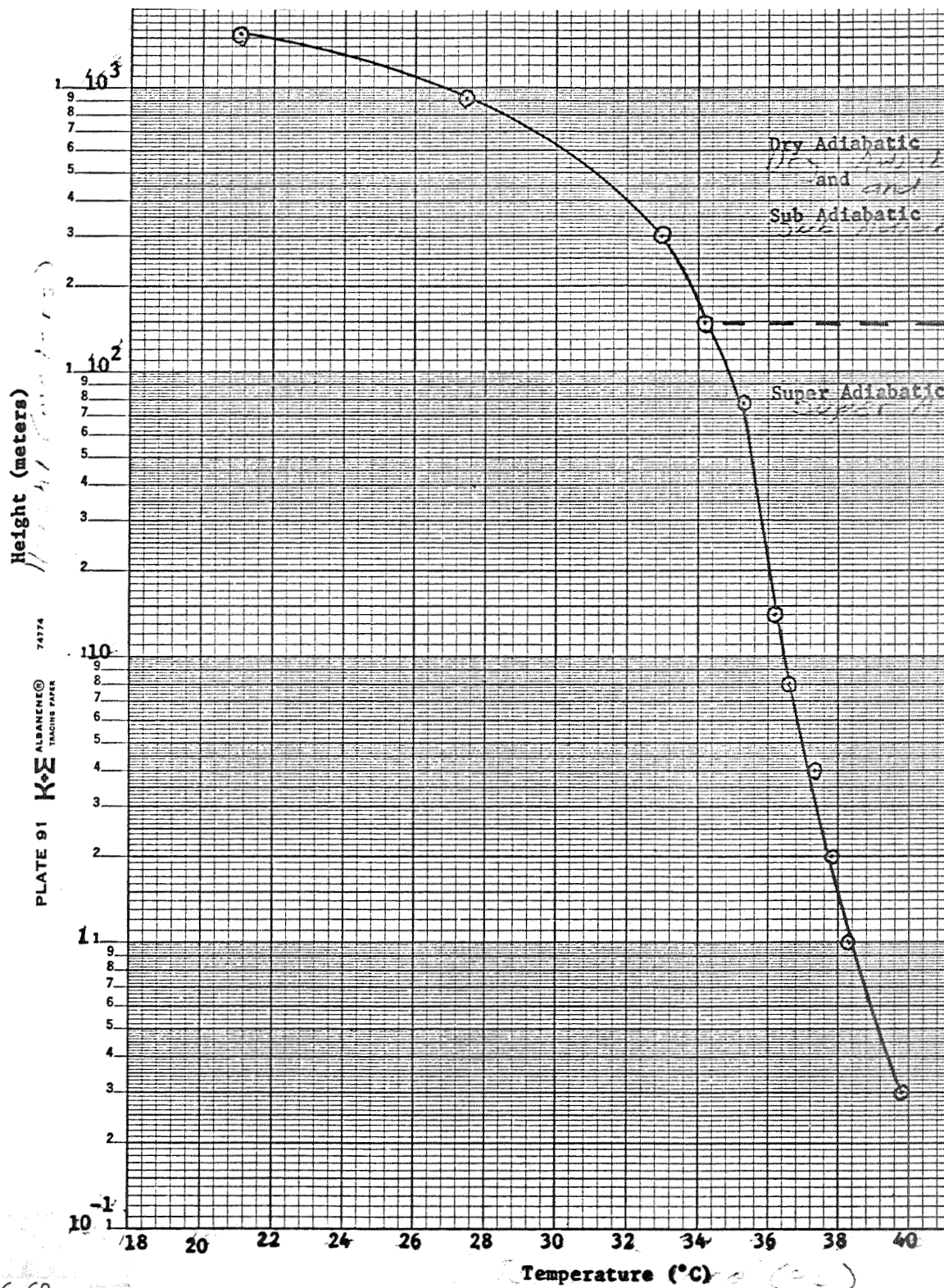
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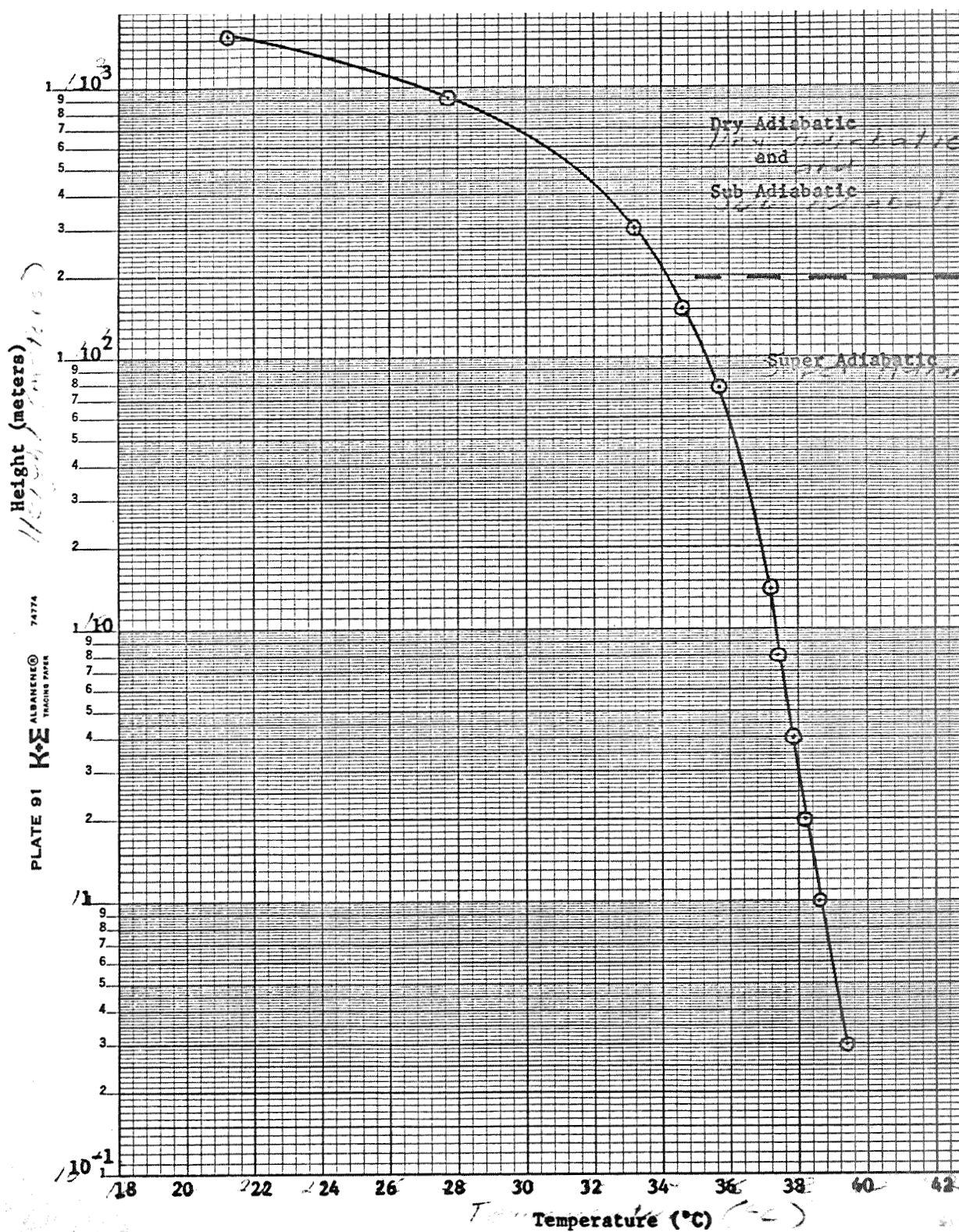
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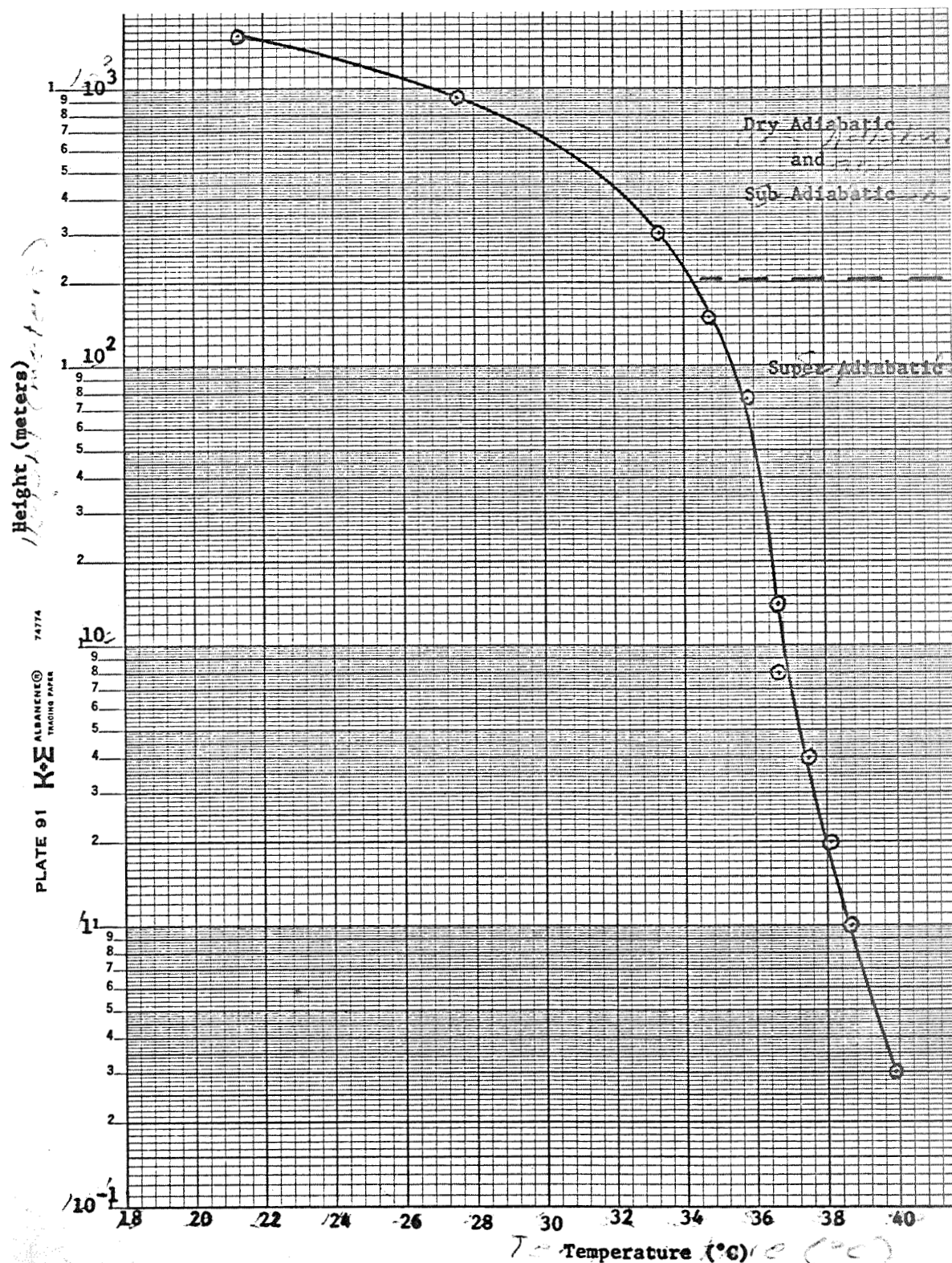
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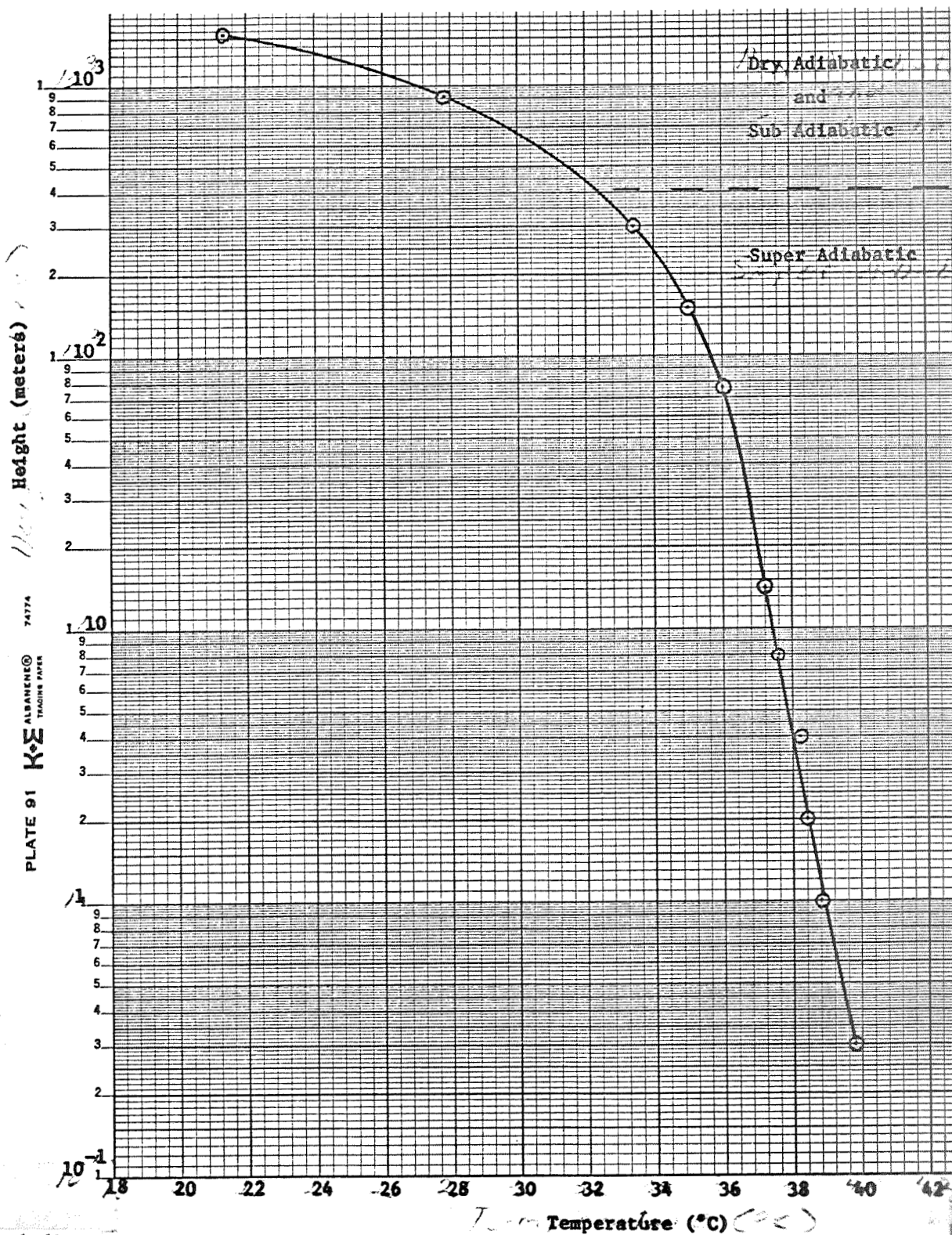
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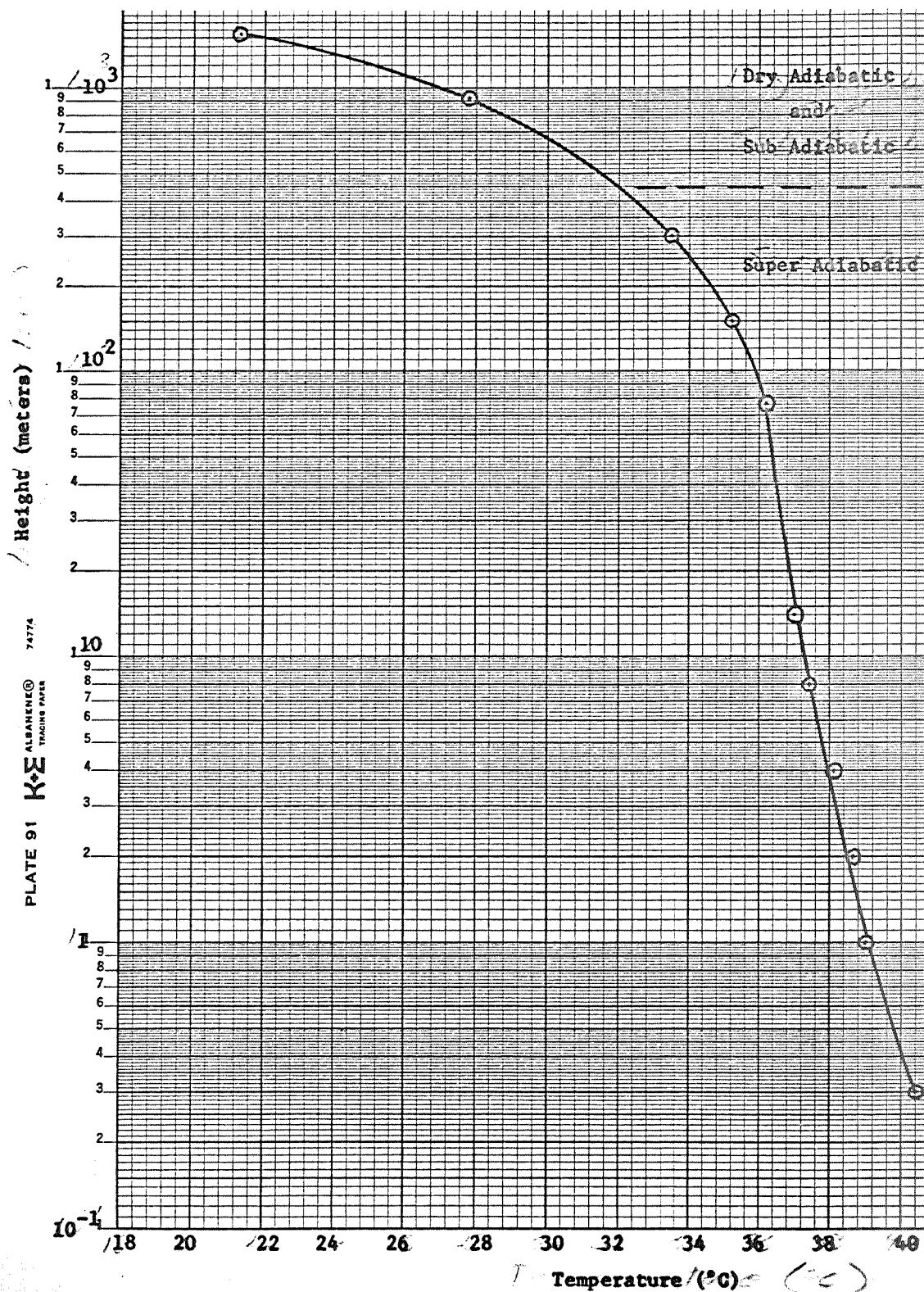
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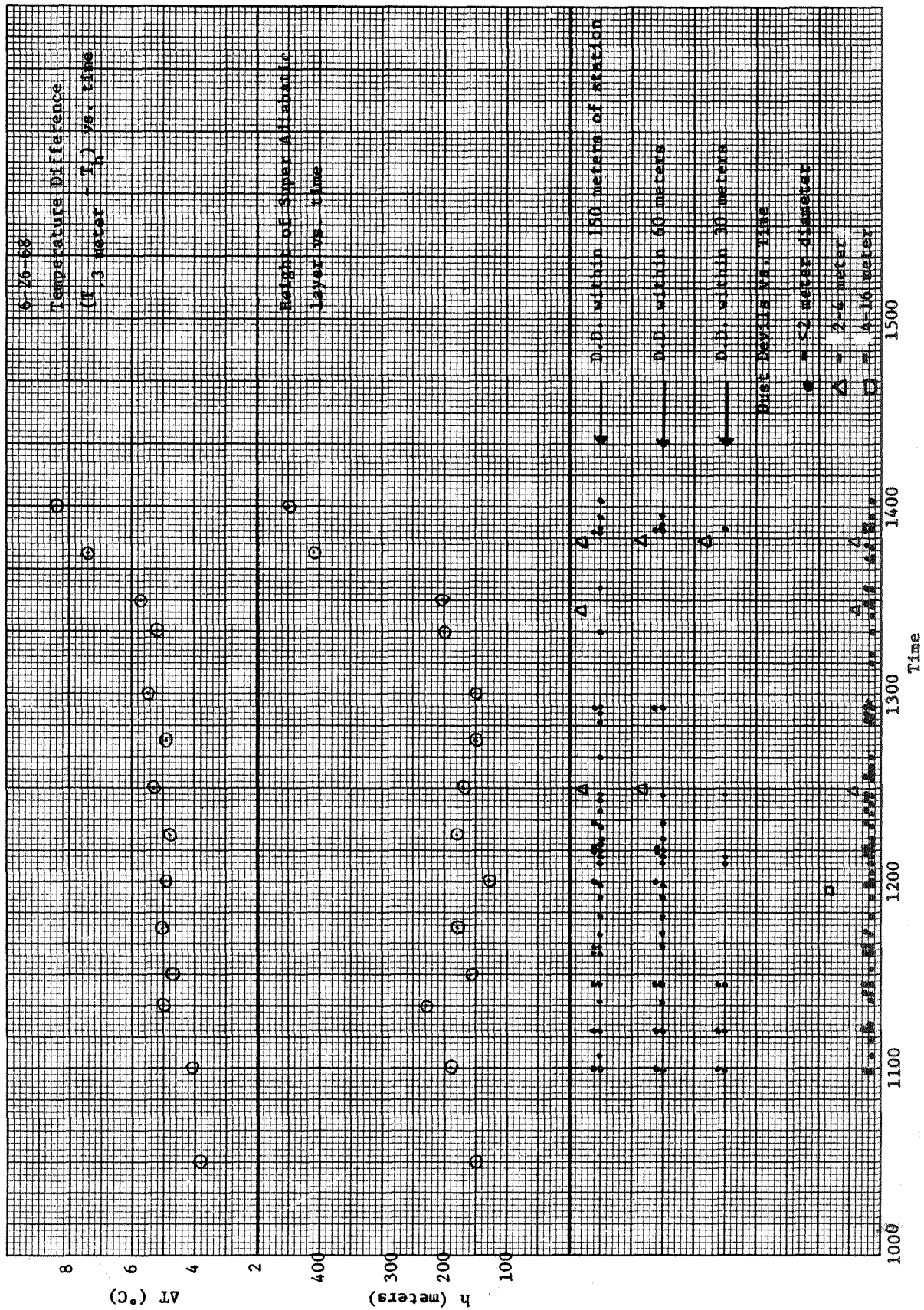
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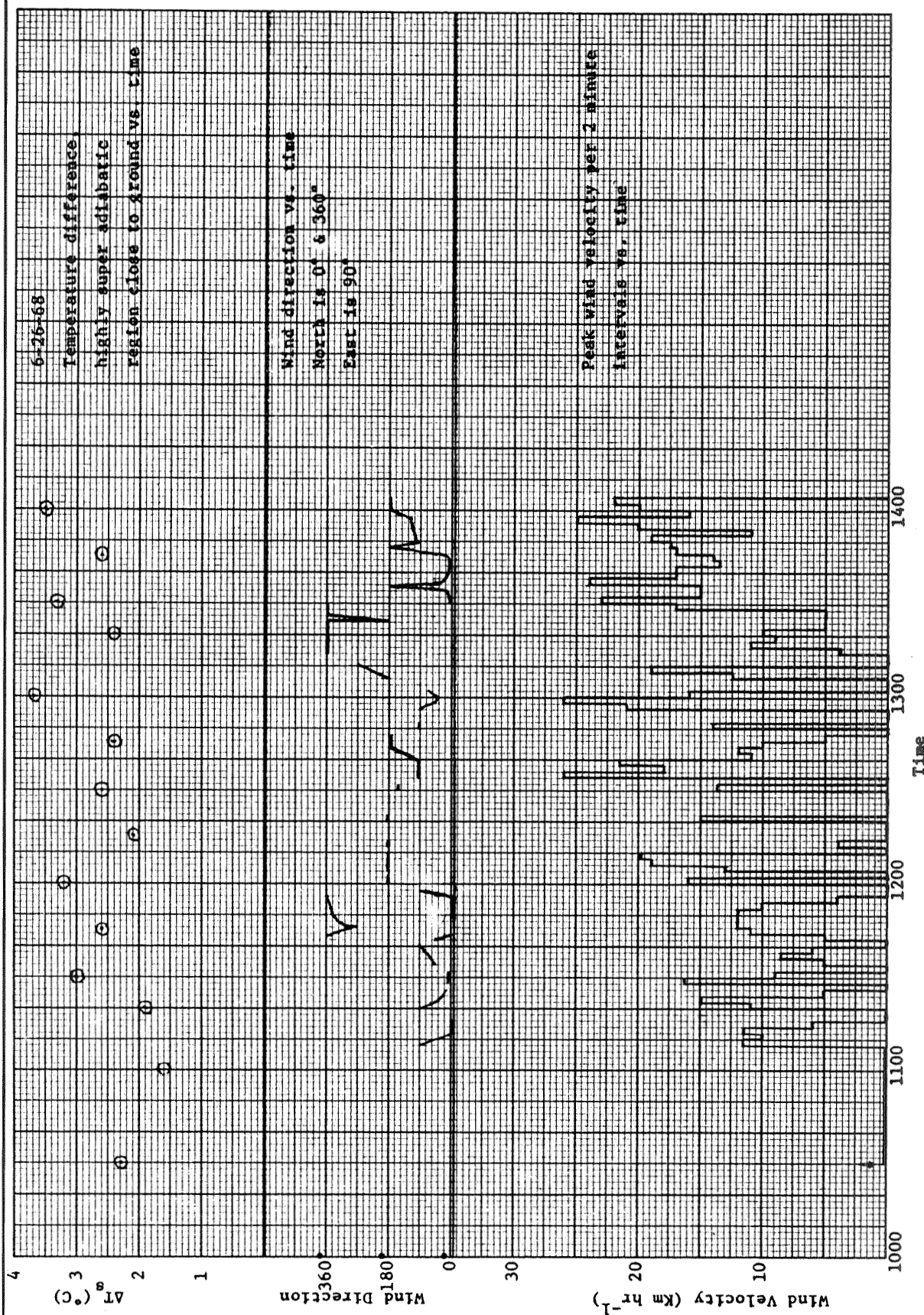
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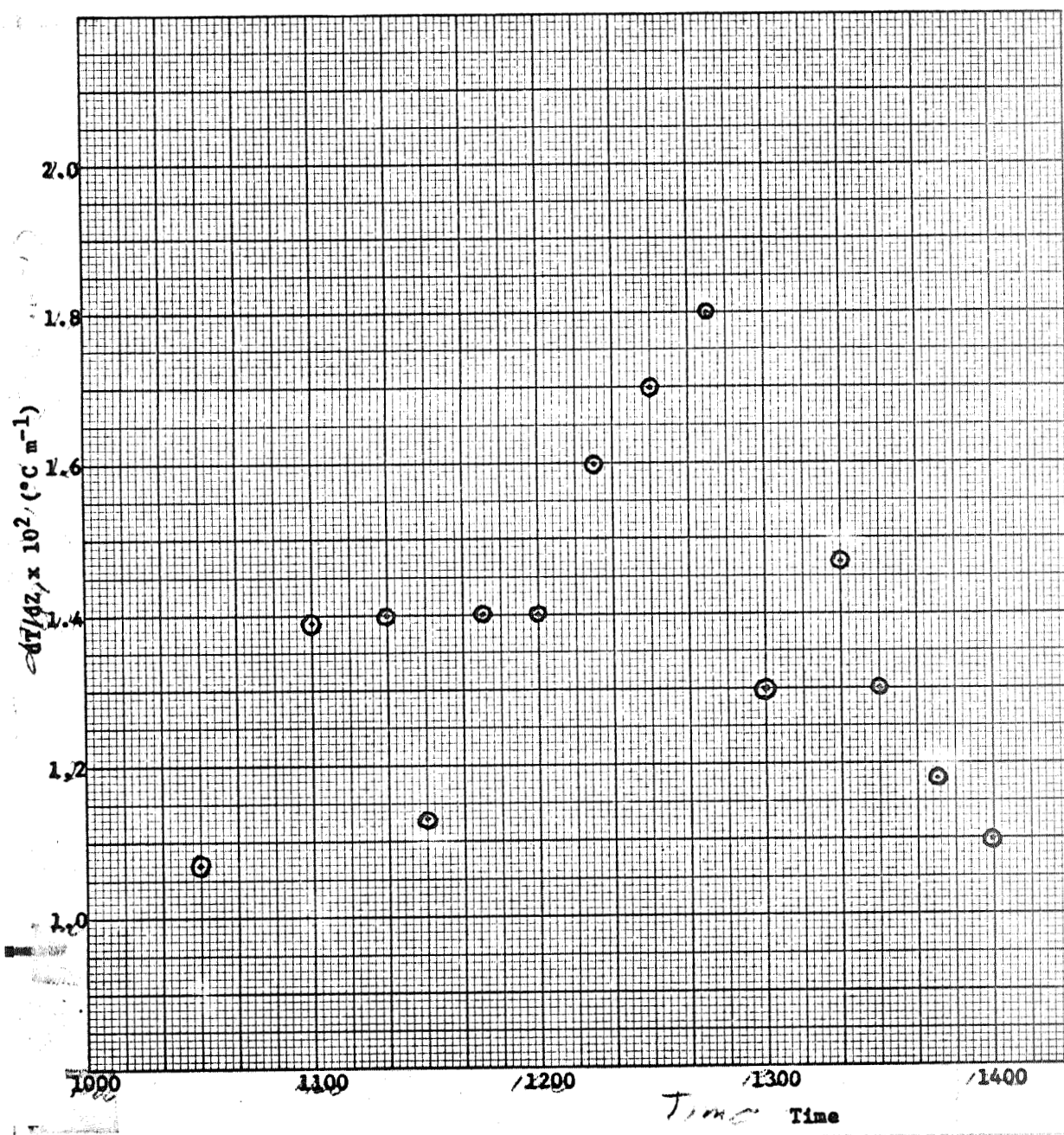


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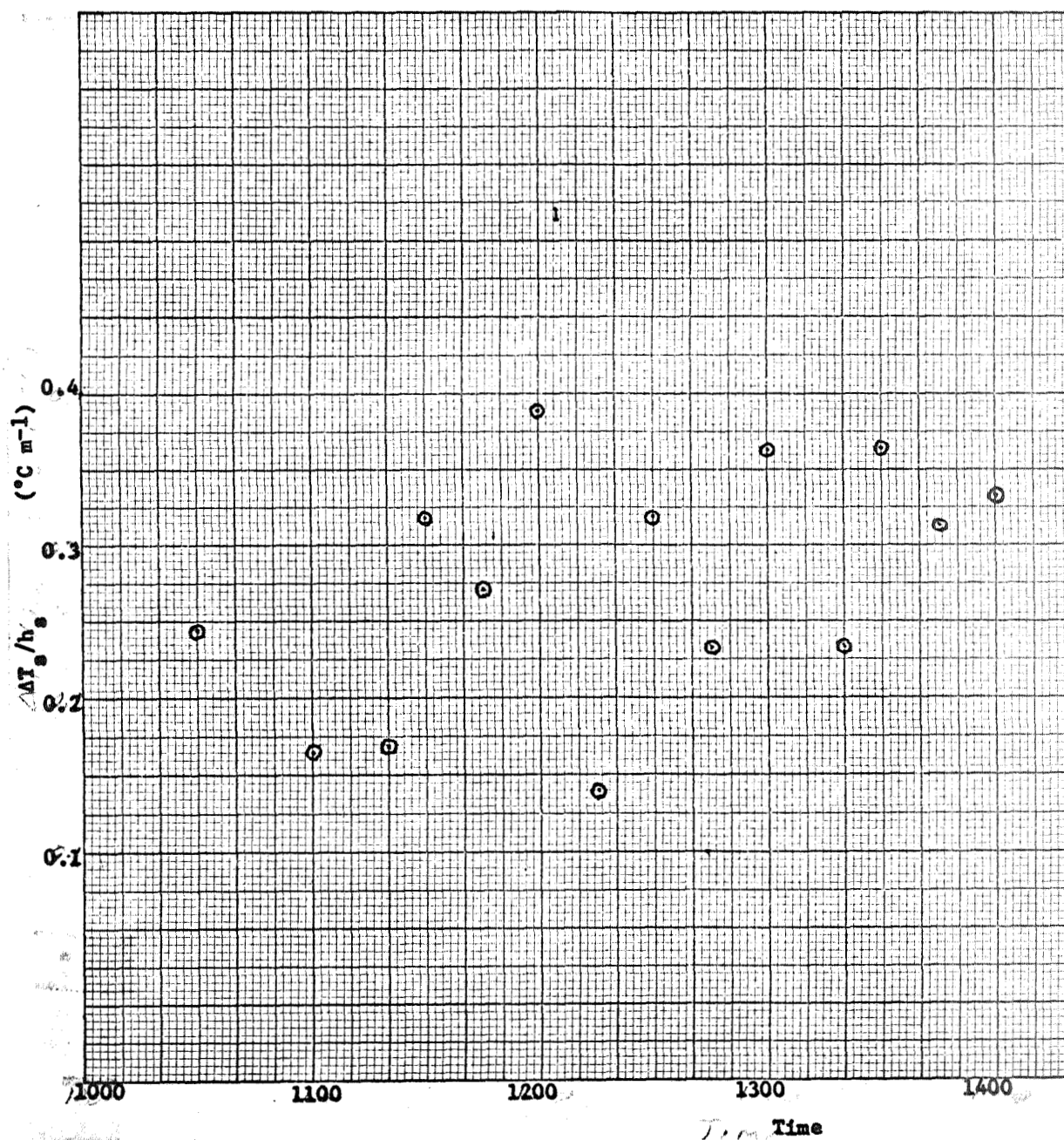




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Lapse Rate (dT/Dz)

vs. Time

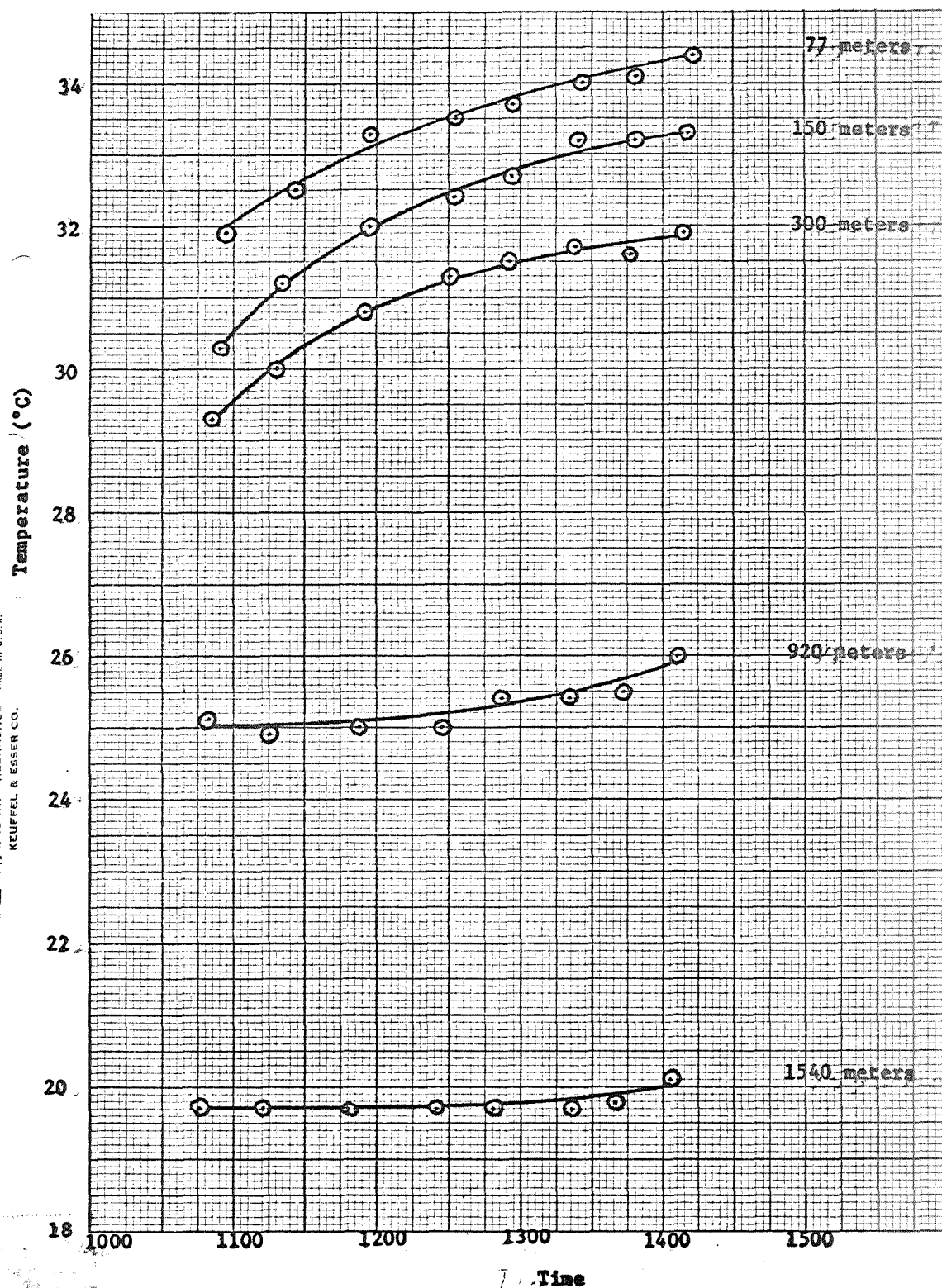


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$\Delta T_s / h_s$ vs. Time

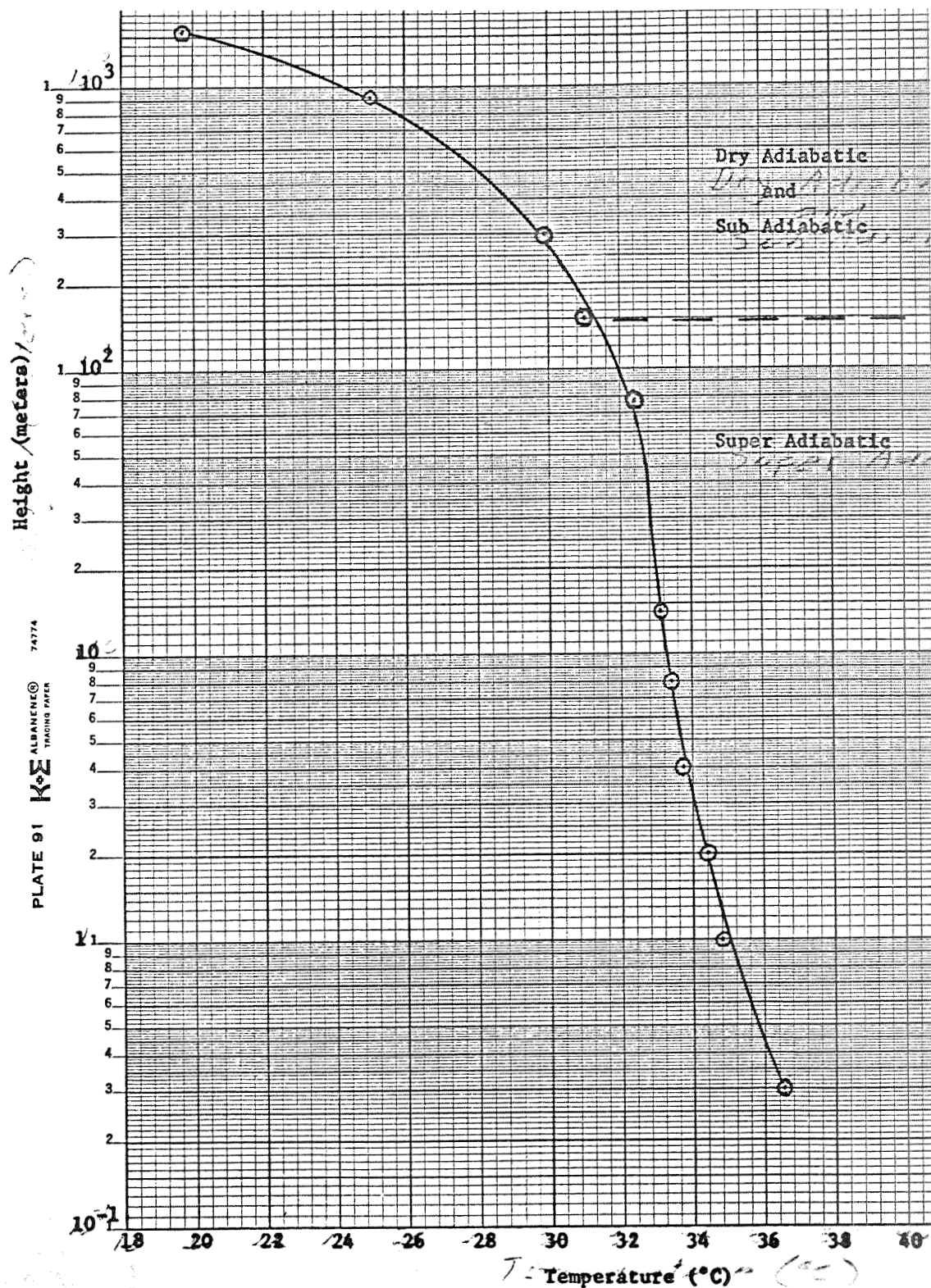
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KEUFFEL & ESSER CO.



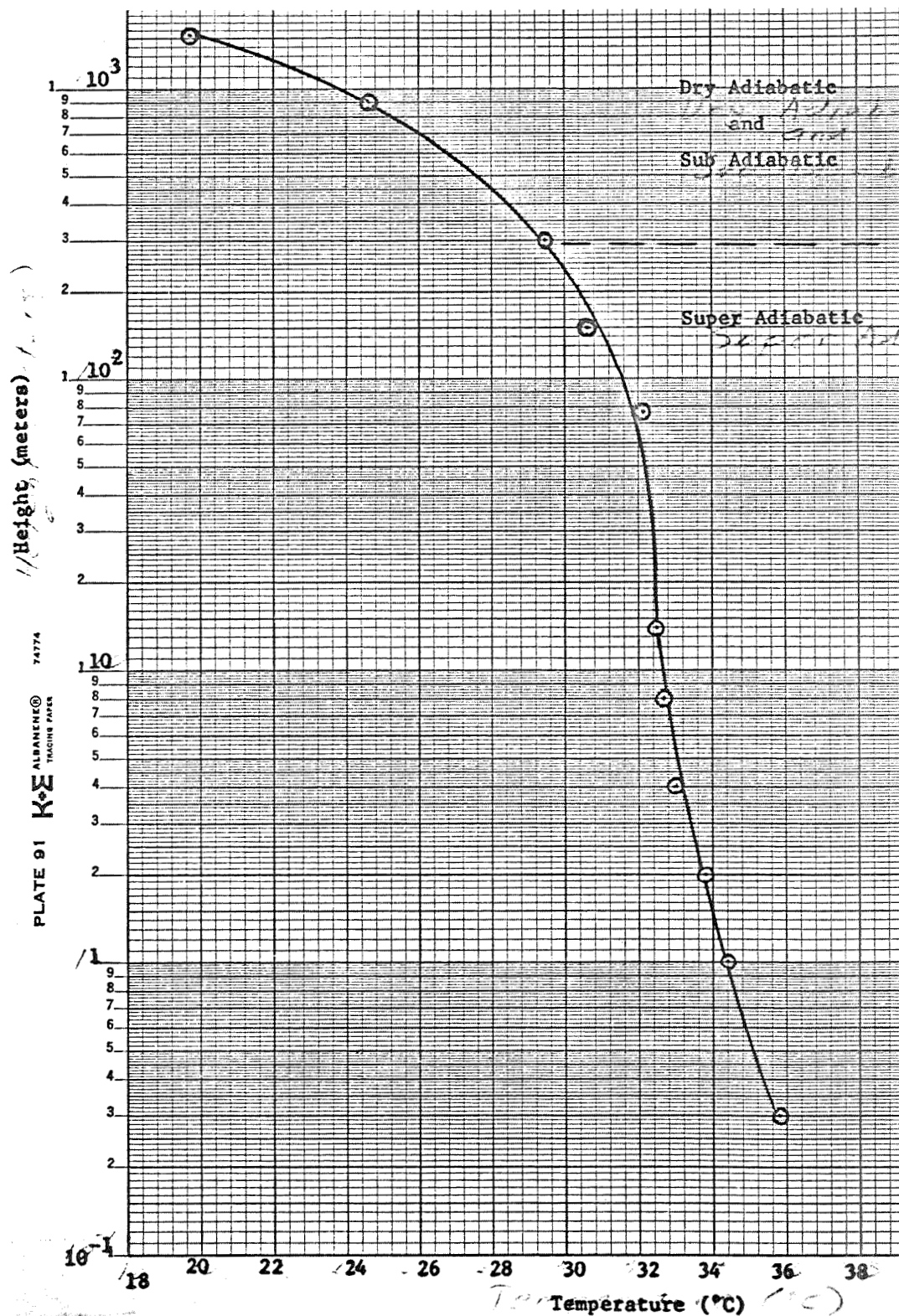
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Aircraft Soundings



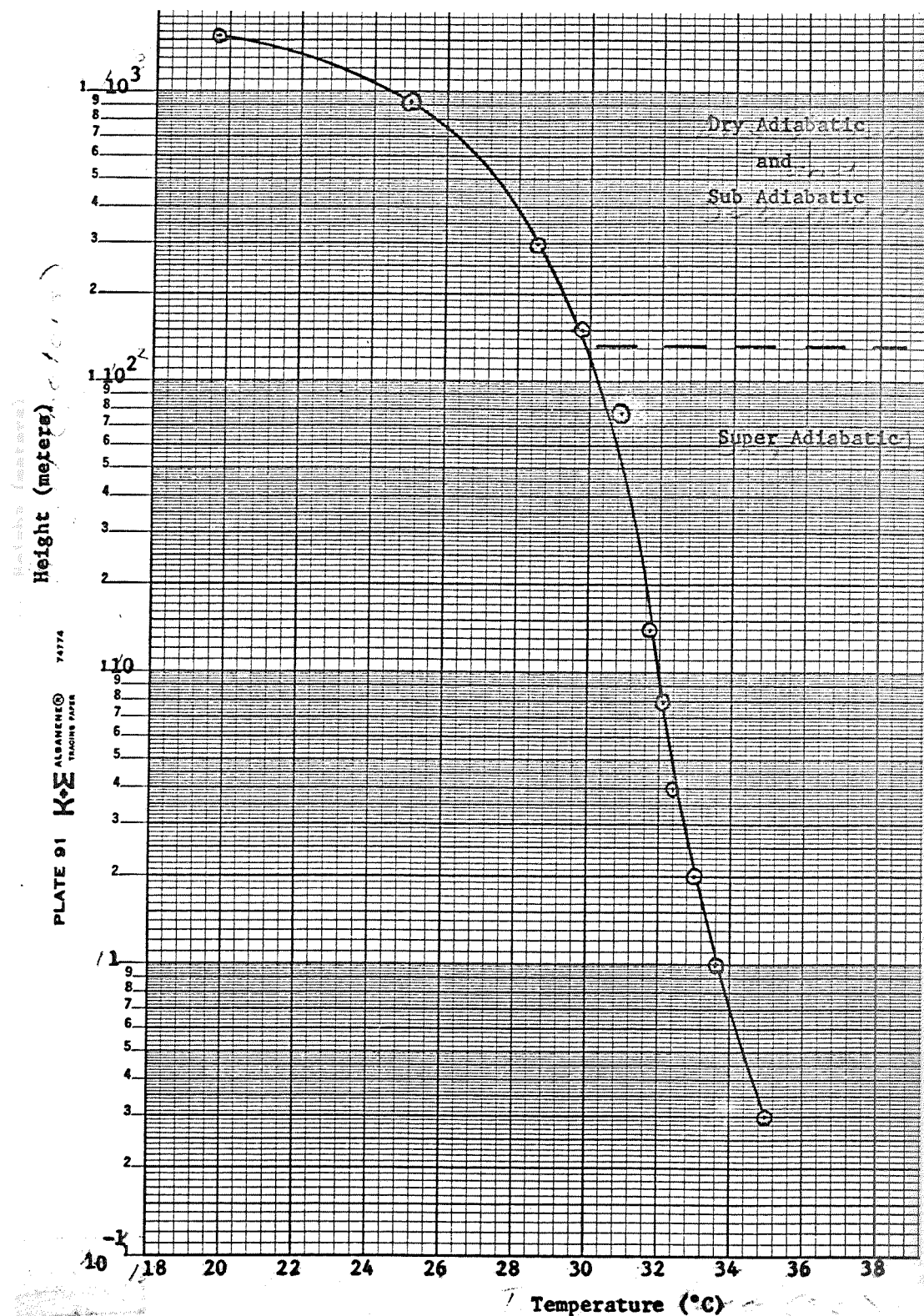
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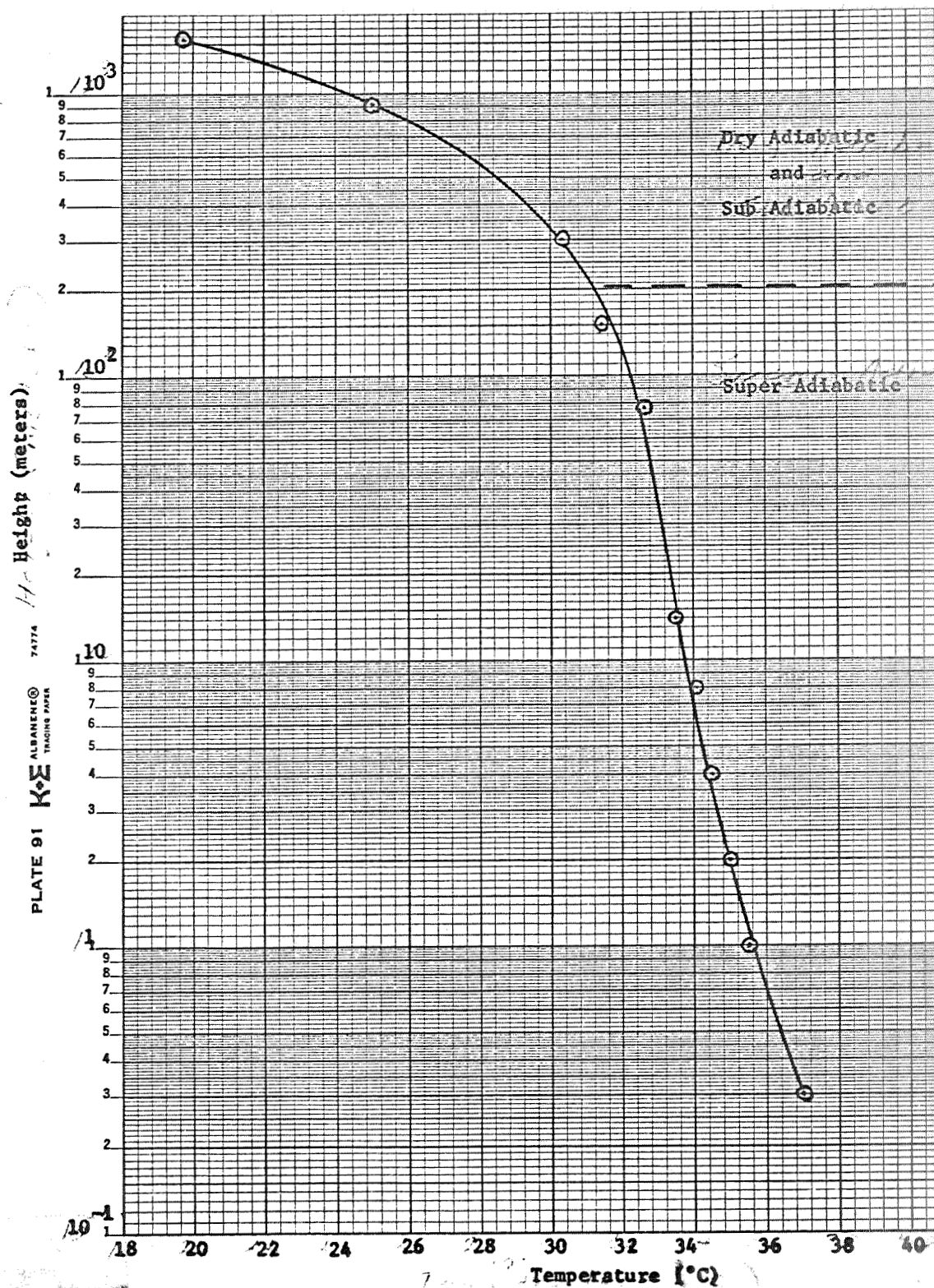
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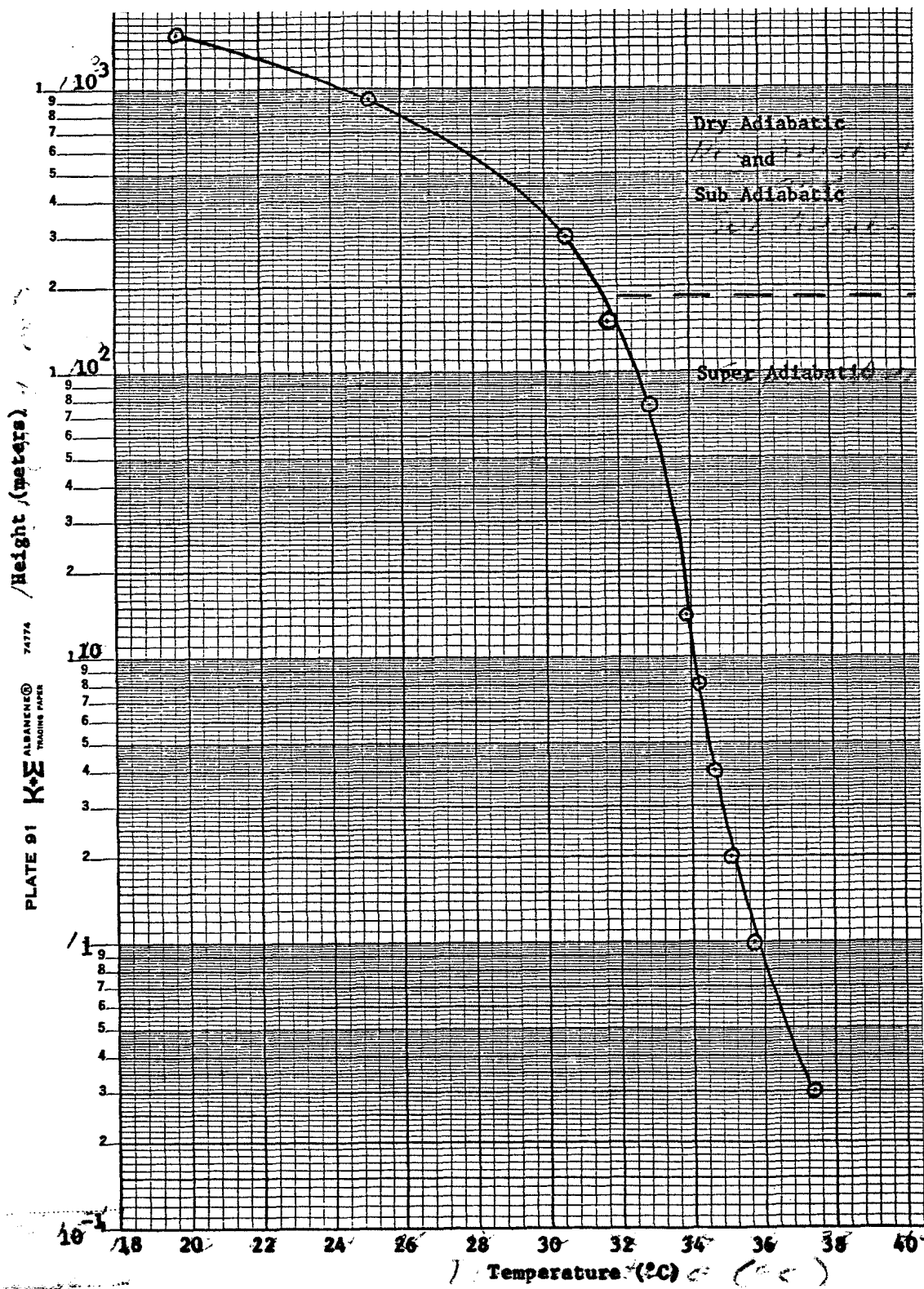
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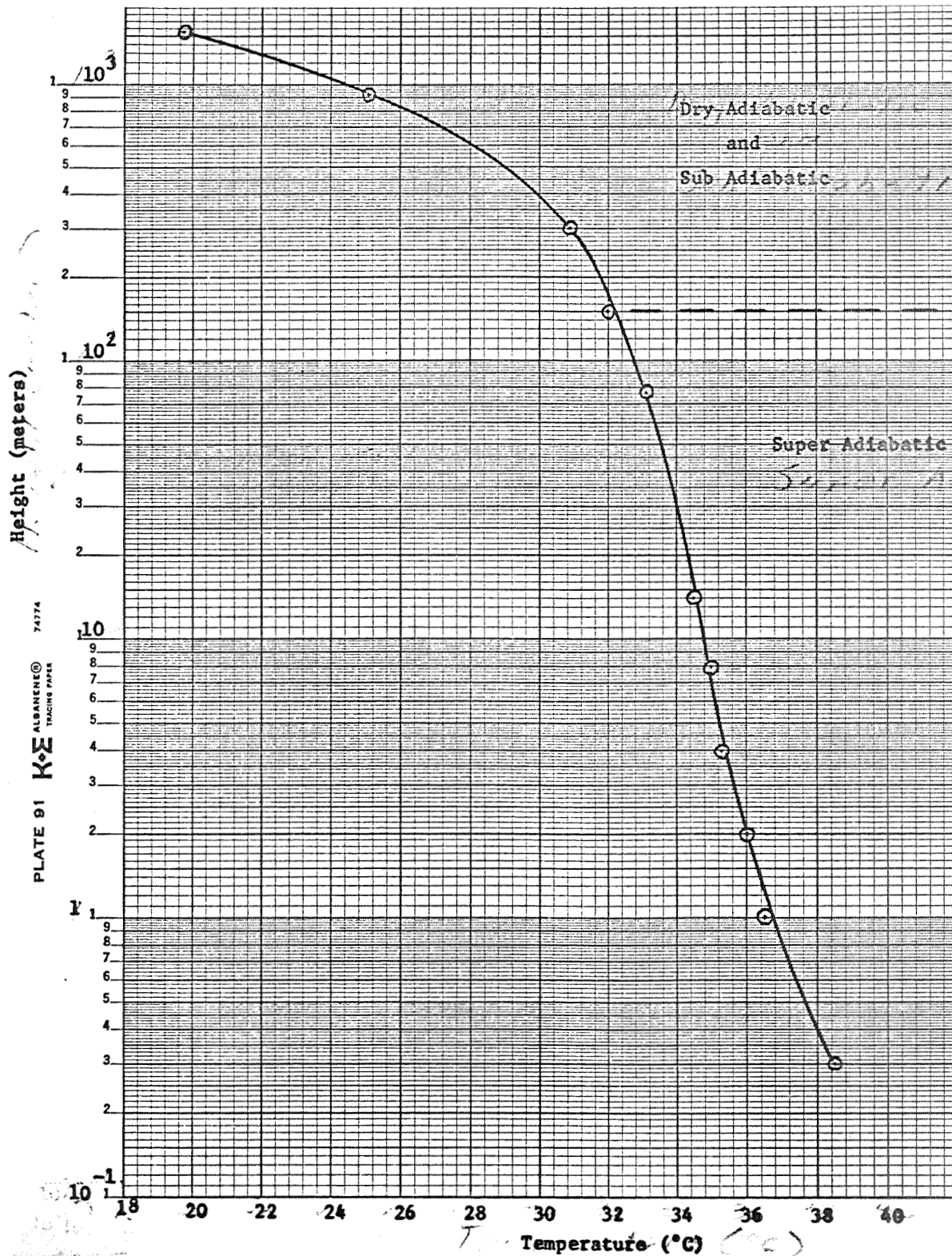
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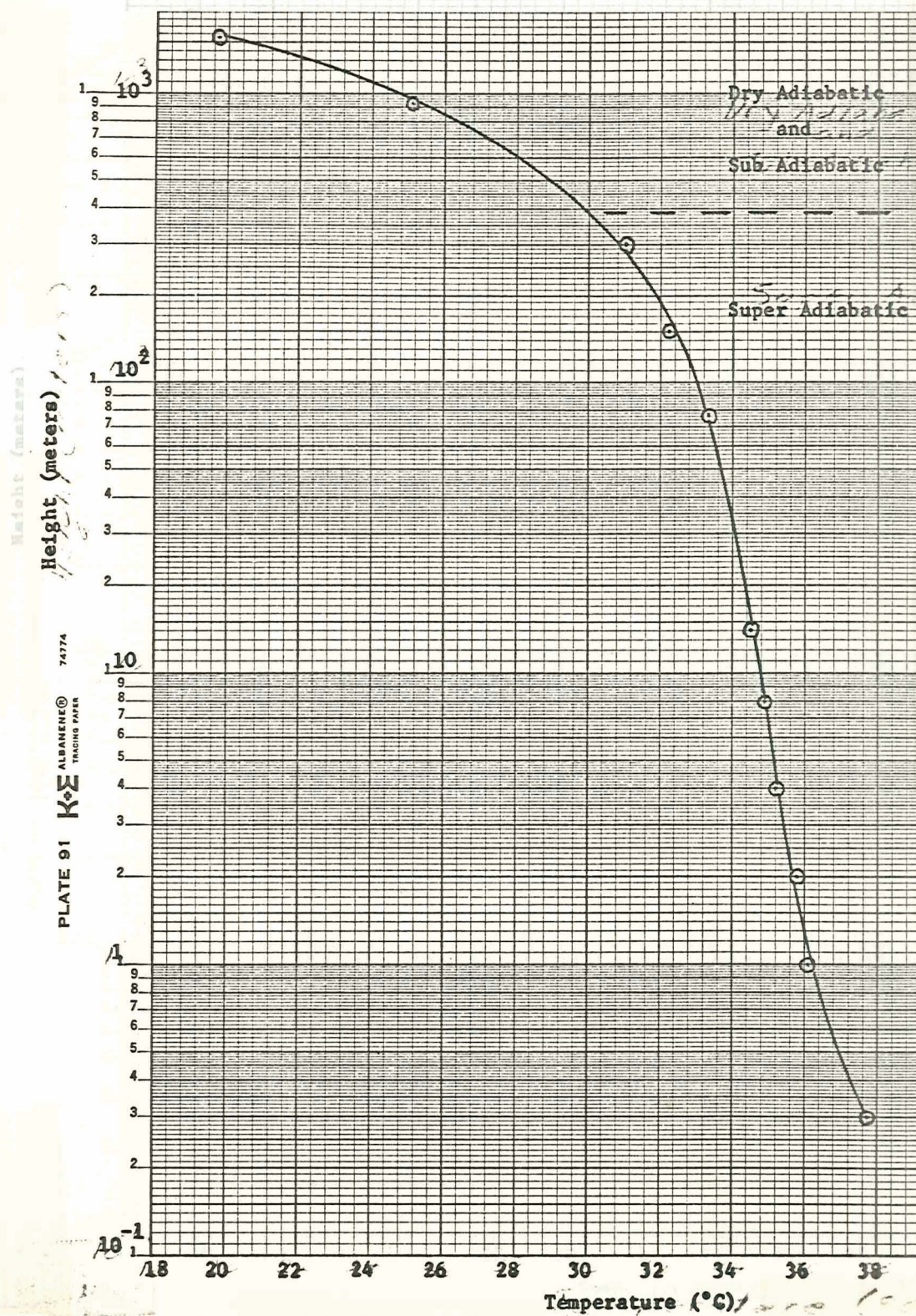
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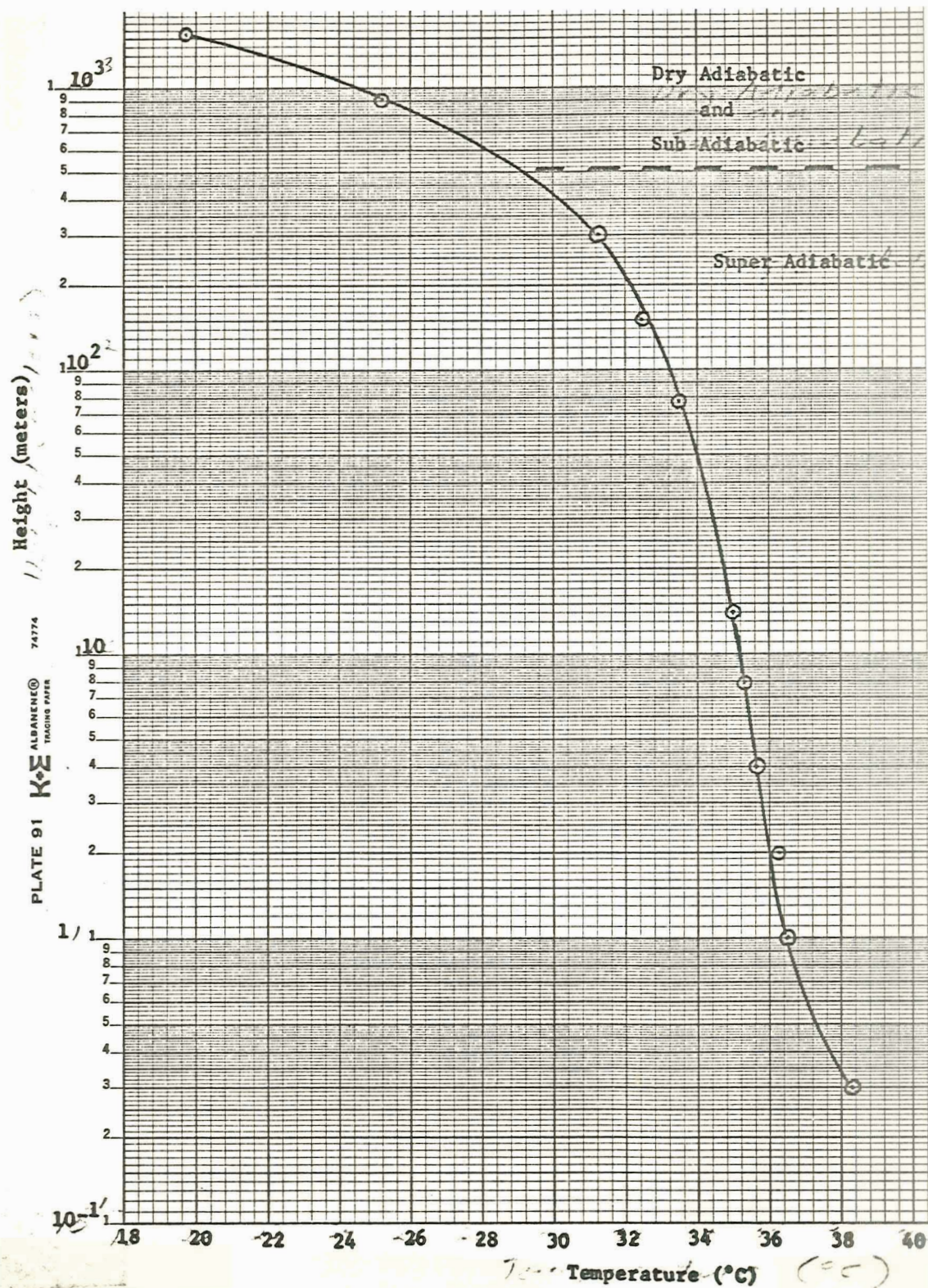
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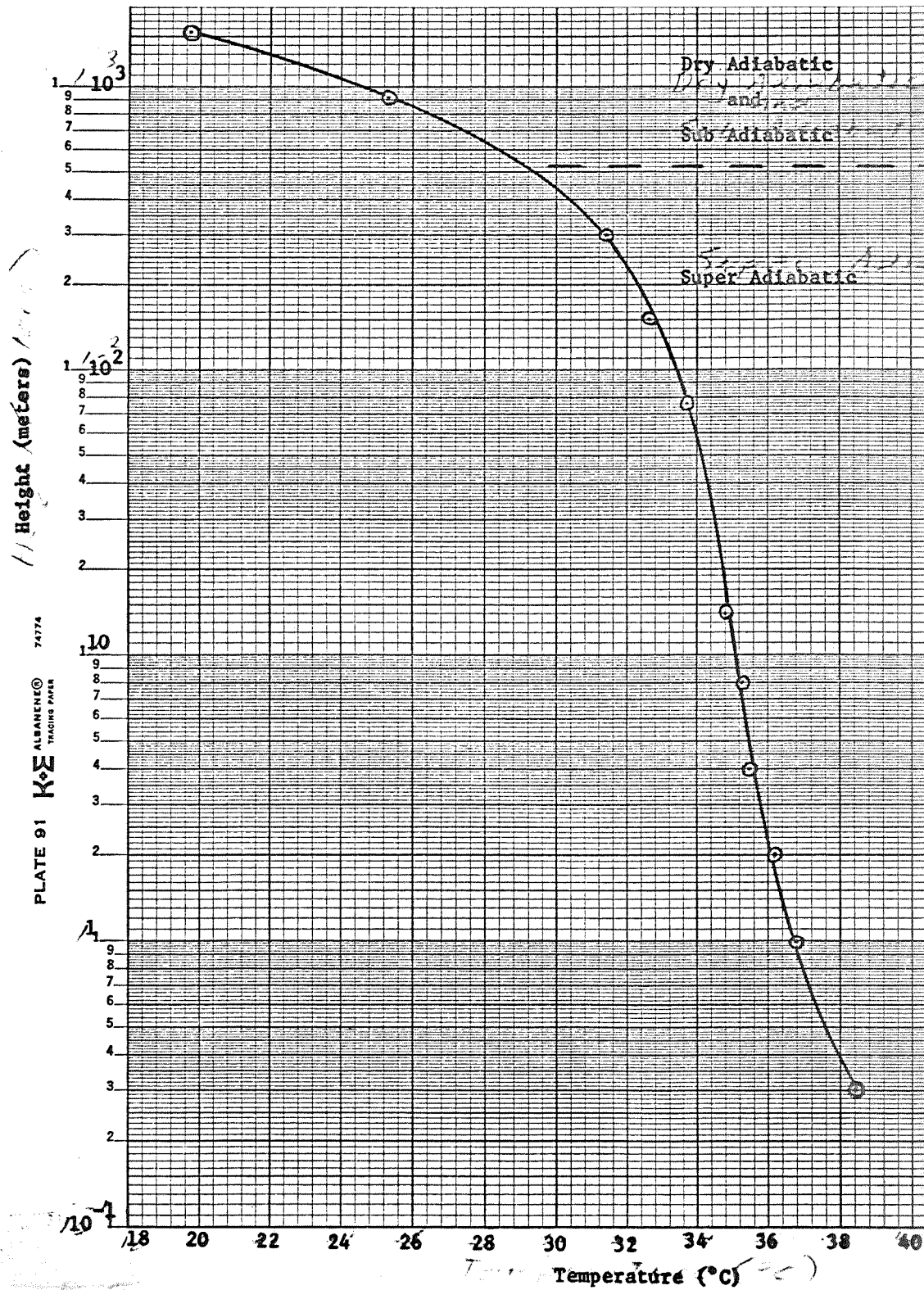
6-27-68

1215 PDT



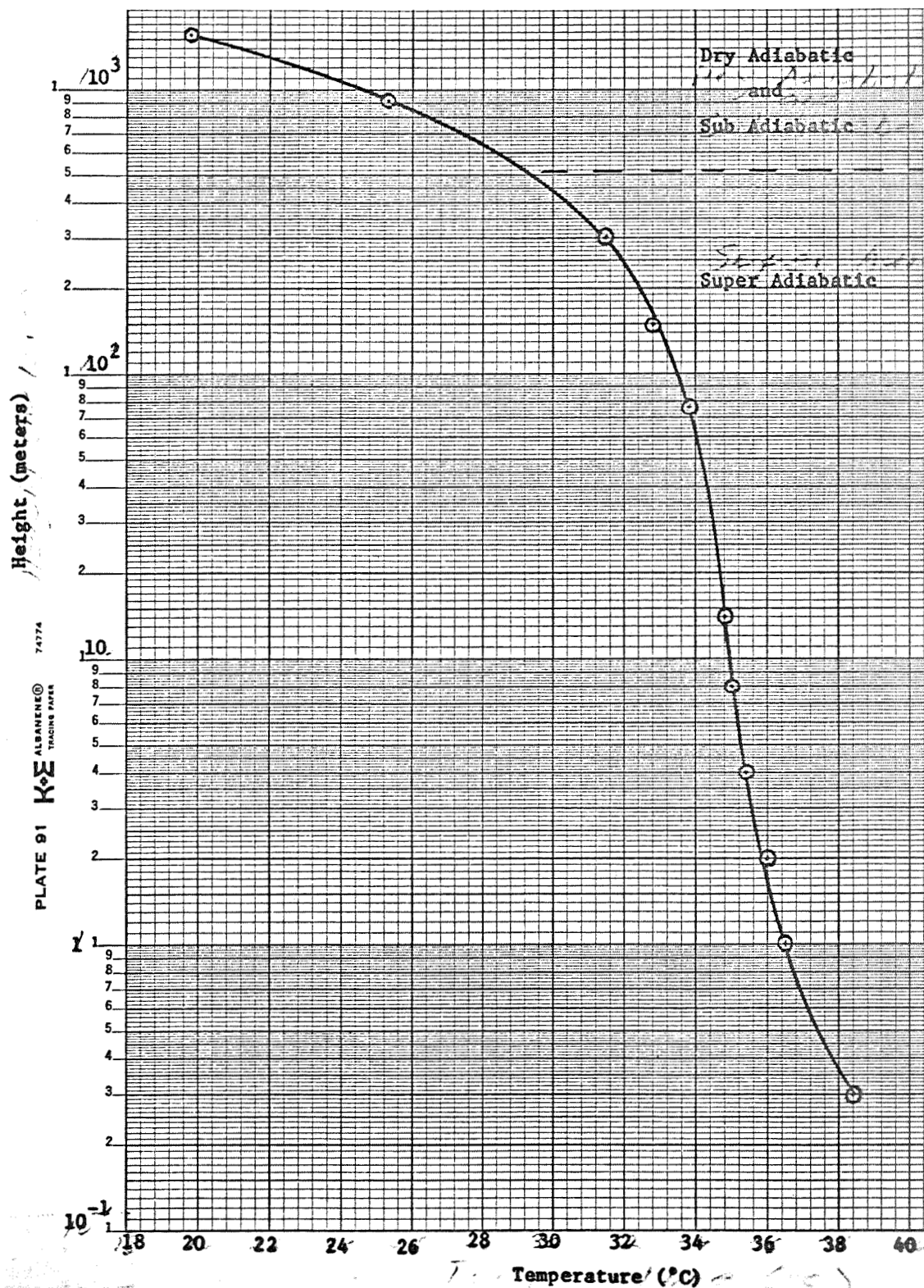
6-27-68

1230 PDT



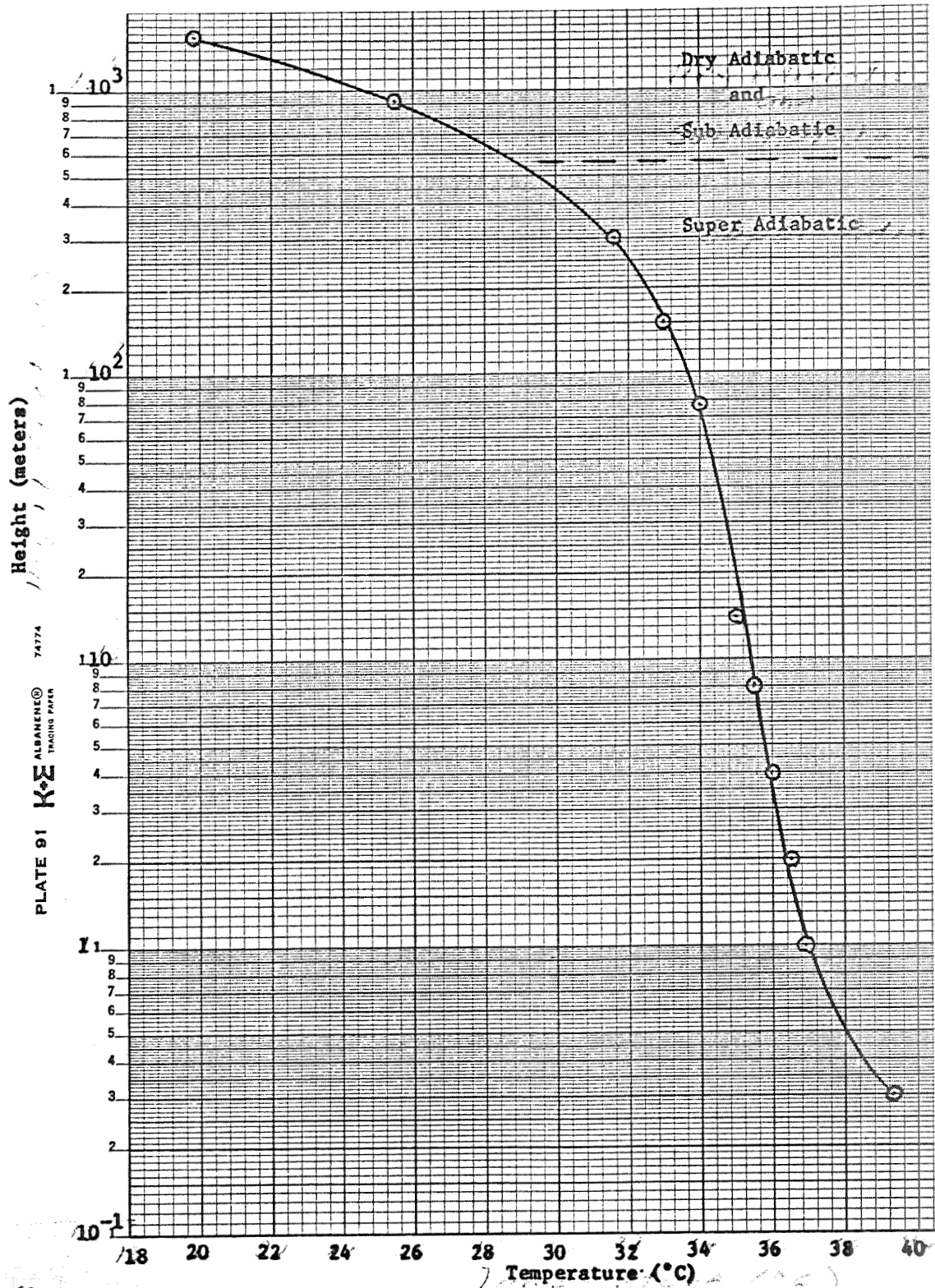
6-27-68

1245 PDT



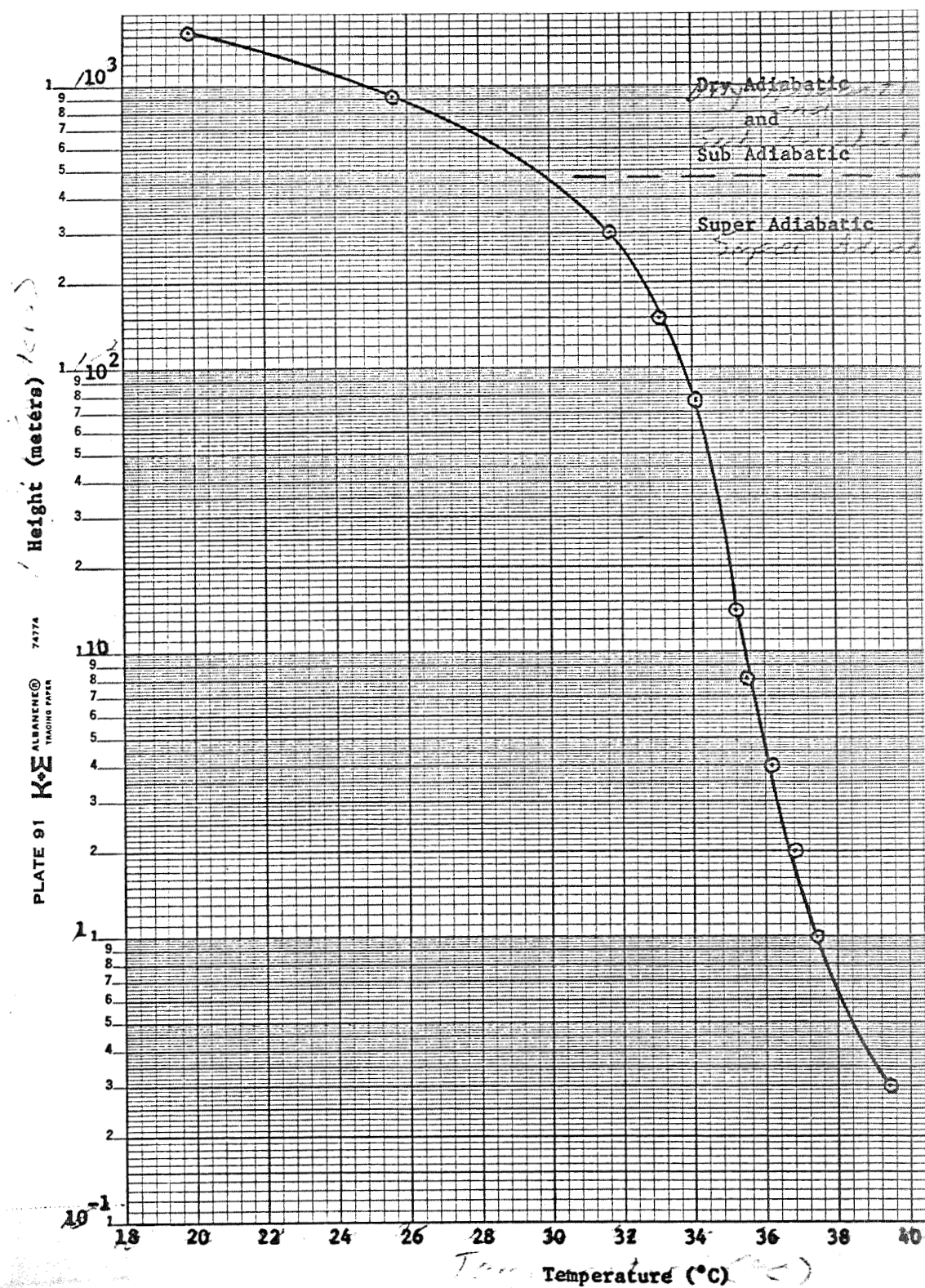
6-27-68

1300 PDT



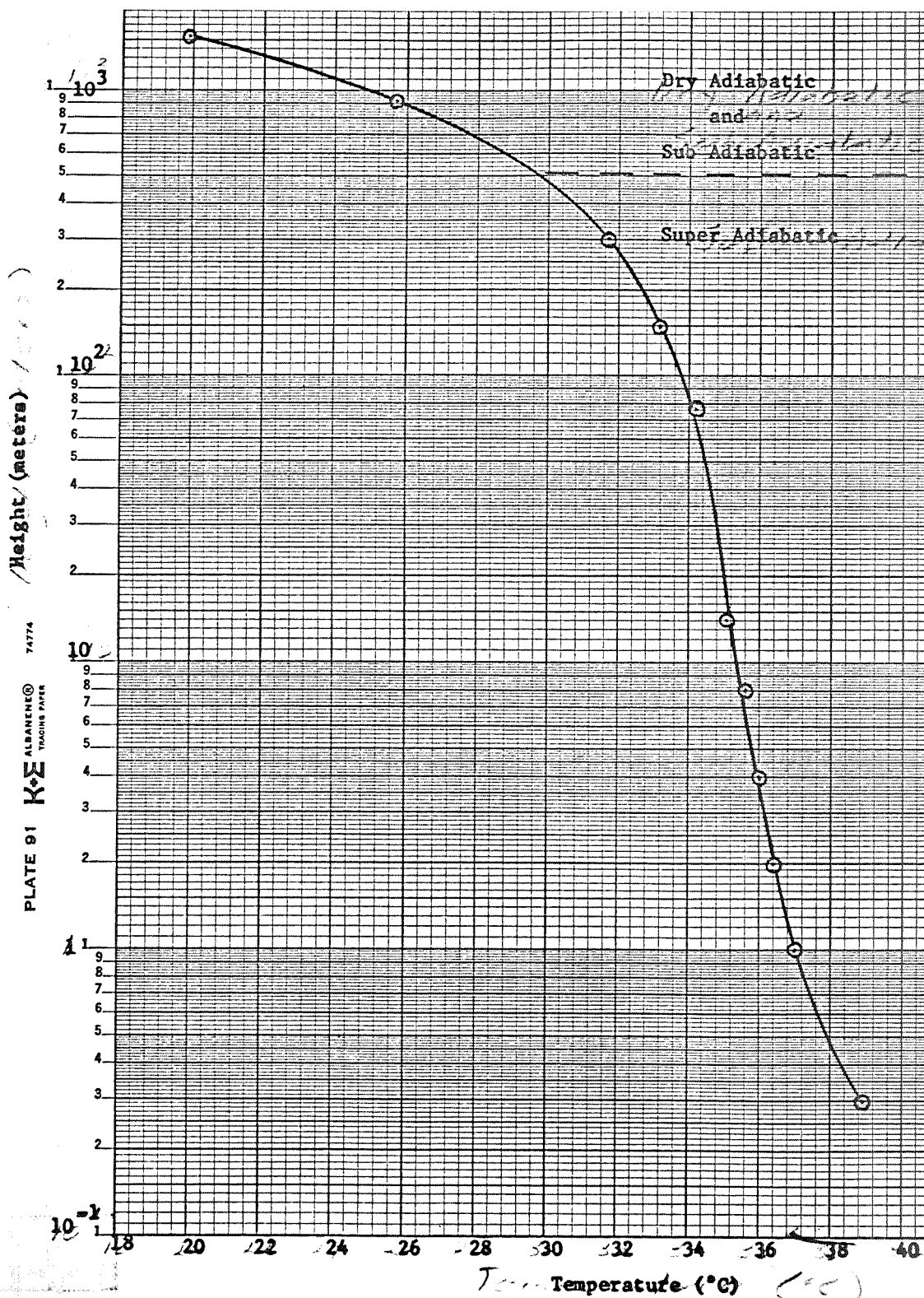
6-27-68

1320 PDT



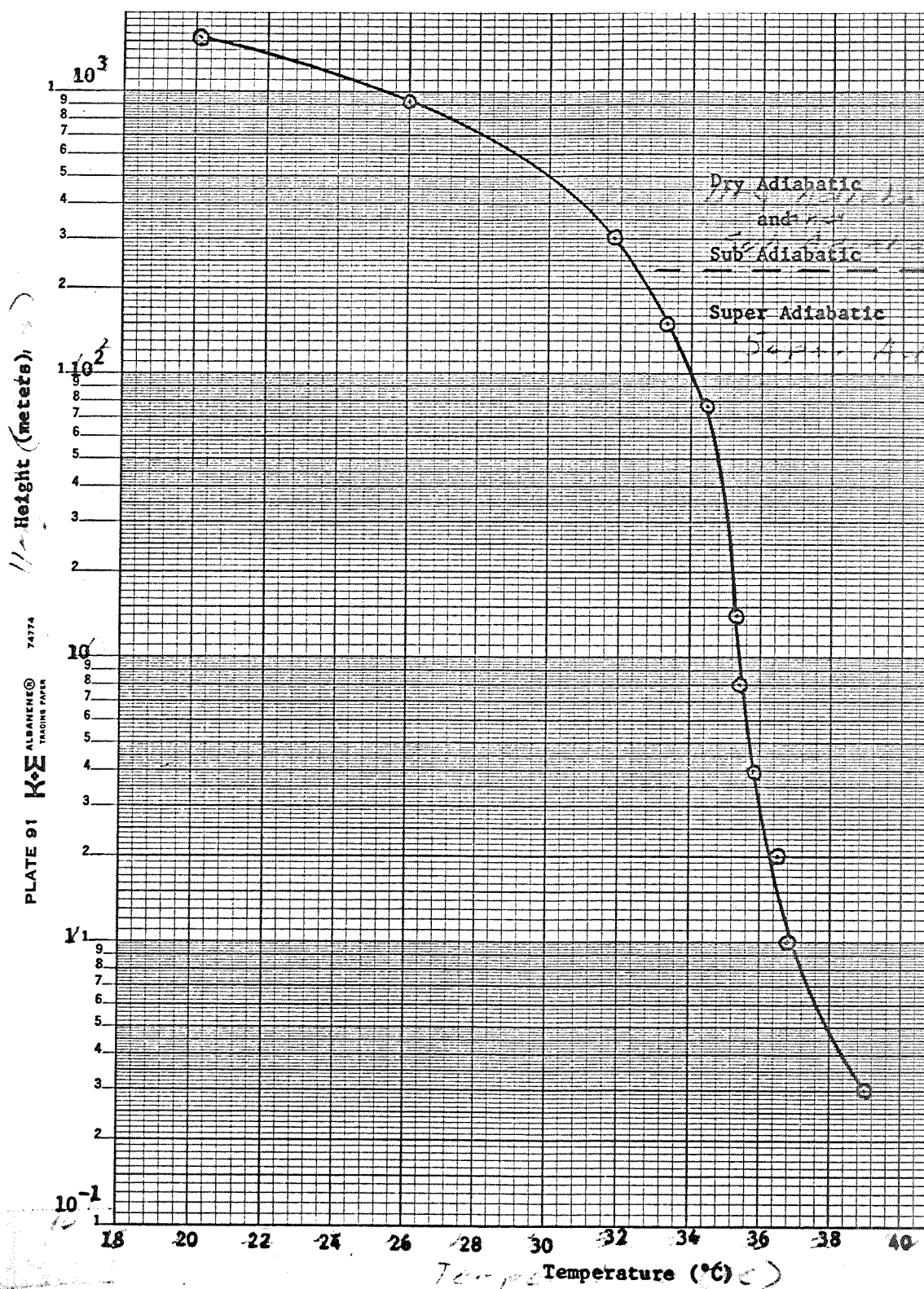
6-27-68

1330 PDT



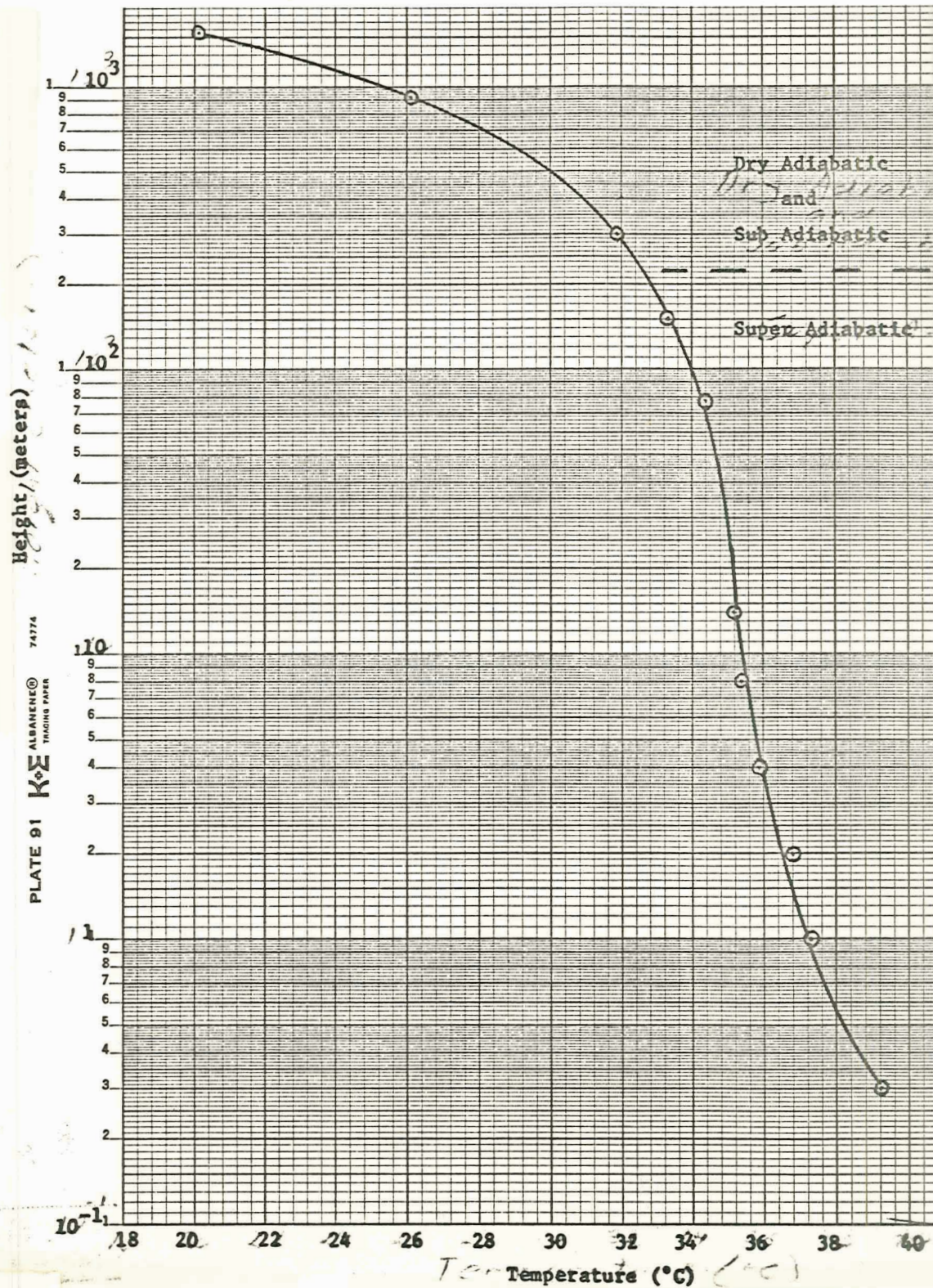
6-27-68

1345 PDT



6-27-68

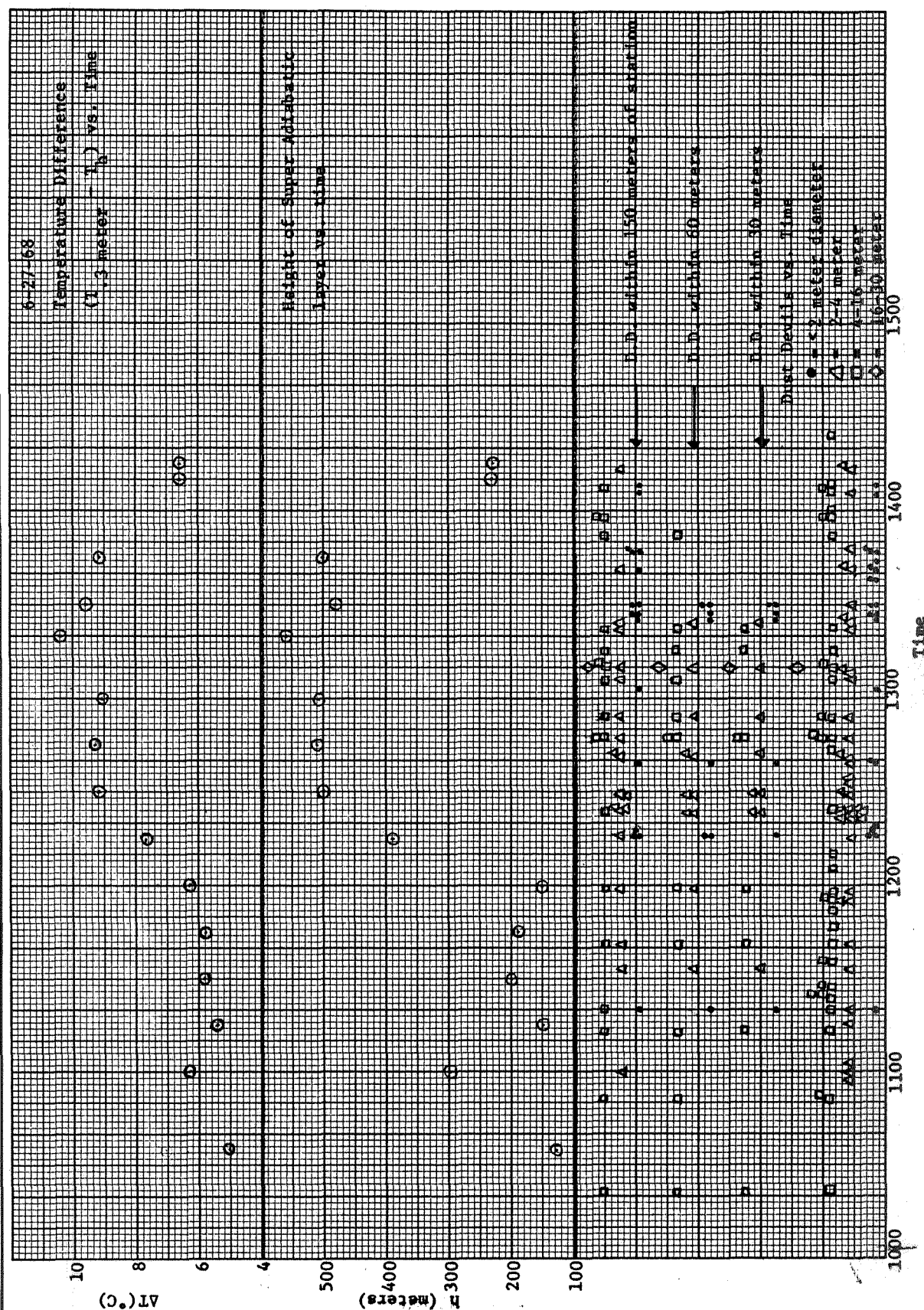
1410 PDT

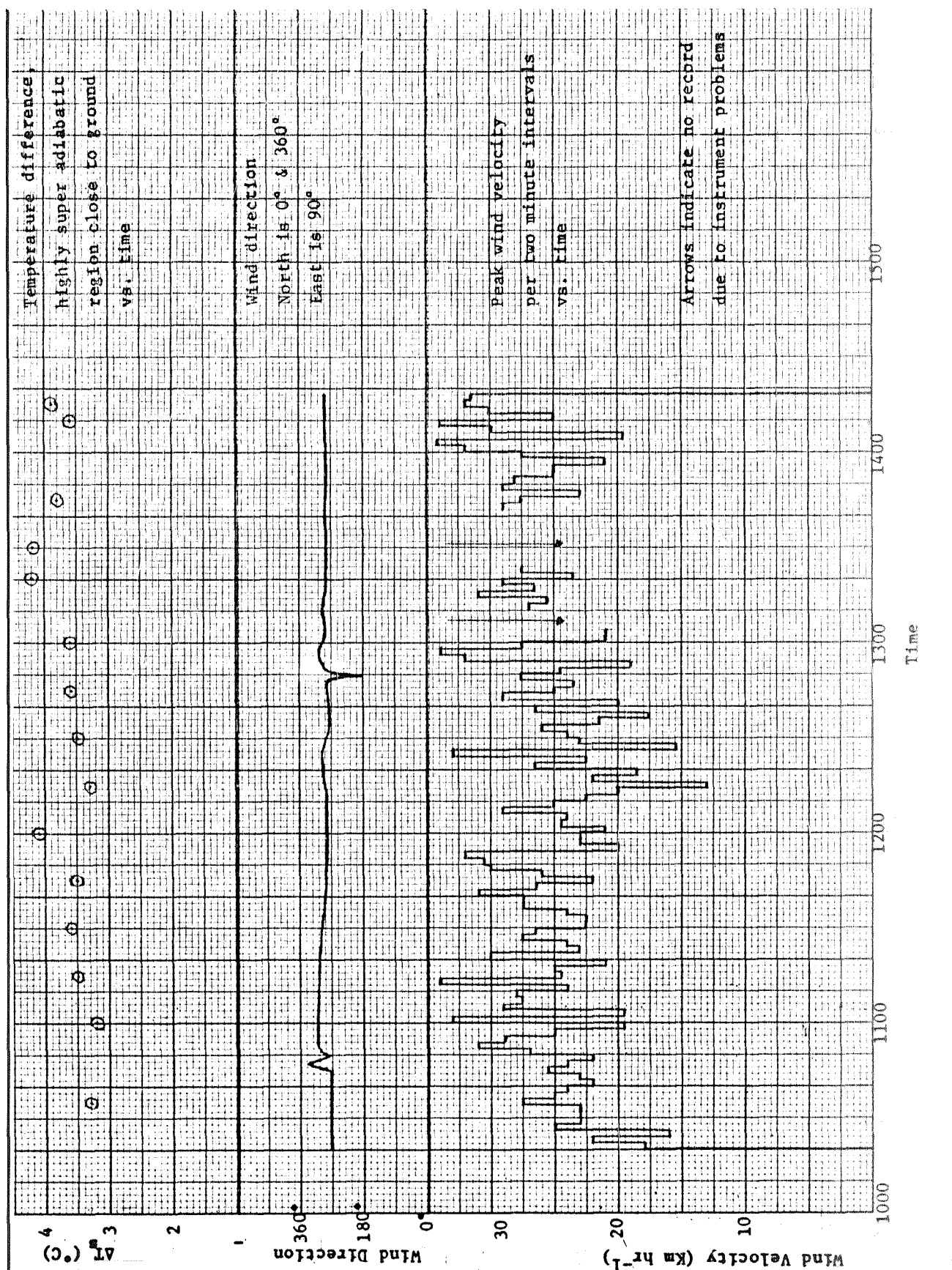


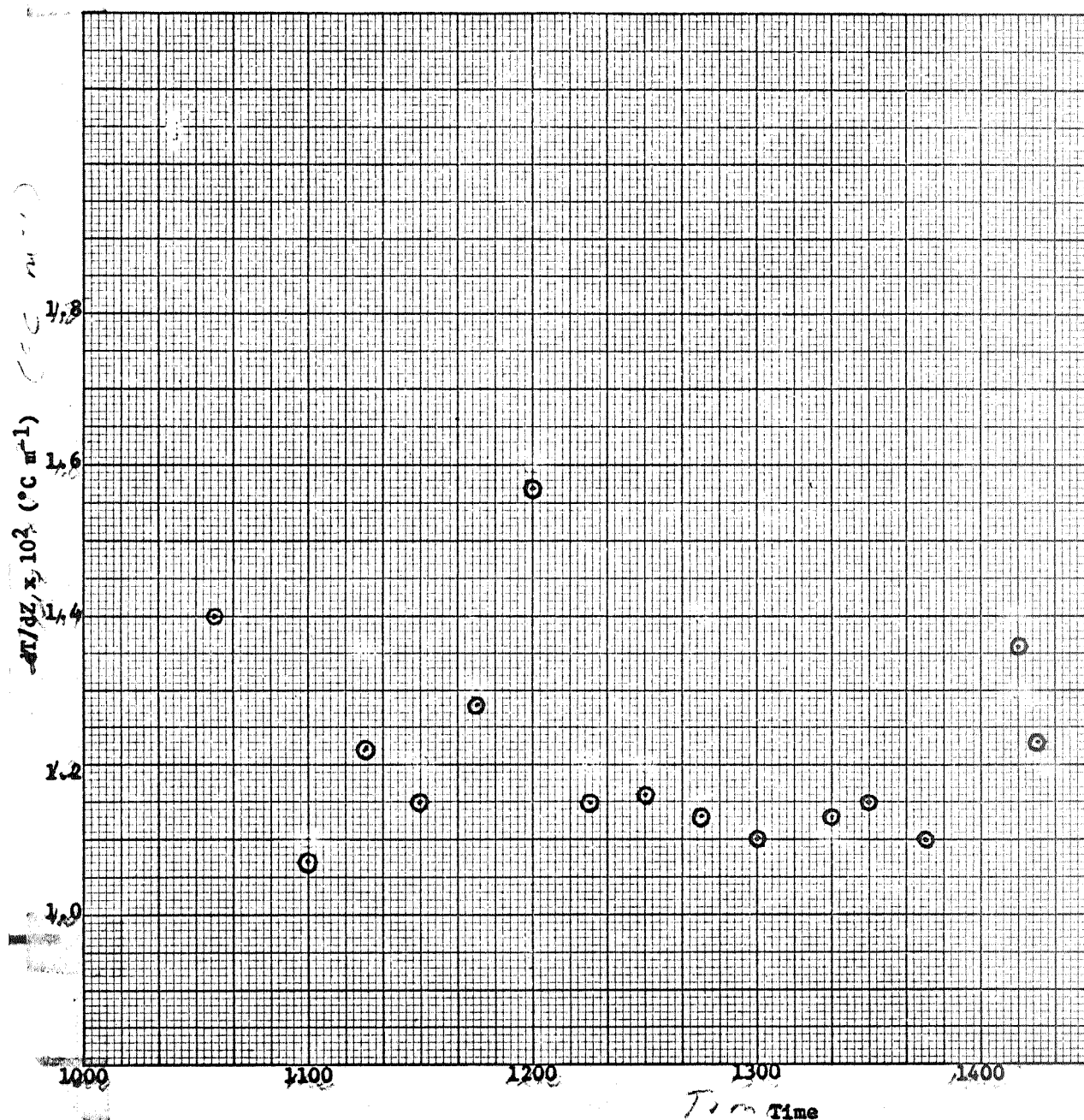
6-27-68

1415 PDT

30-692-9 (8-68)



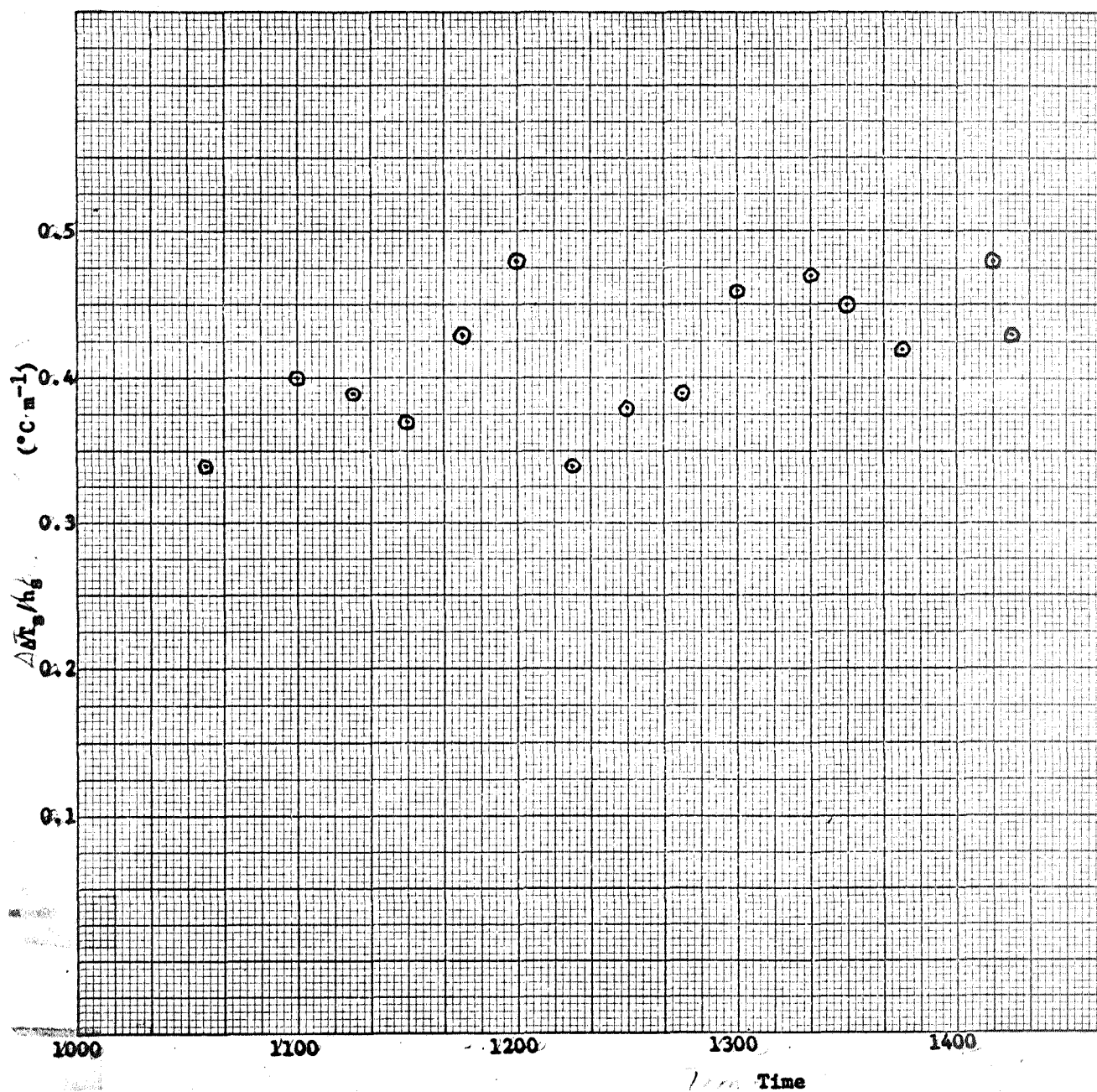




6-27-68

Lapse Rate (dT/dZ)

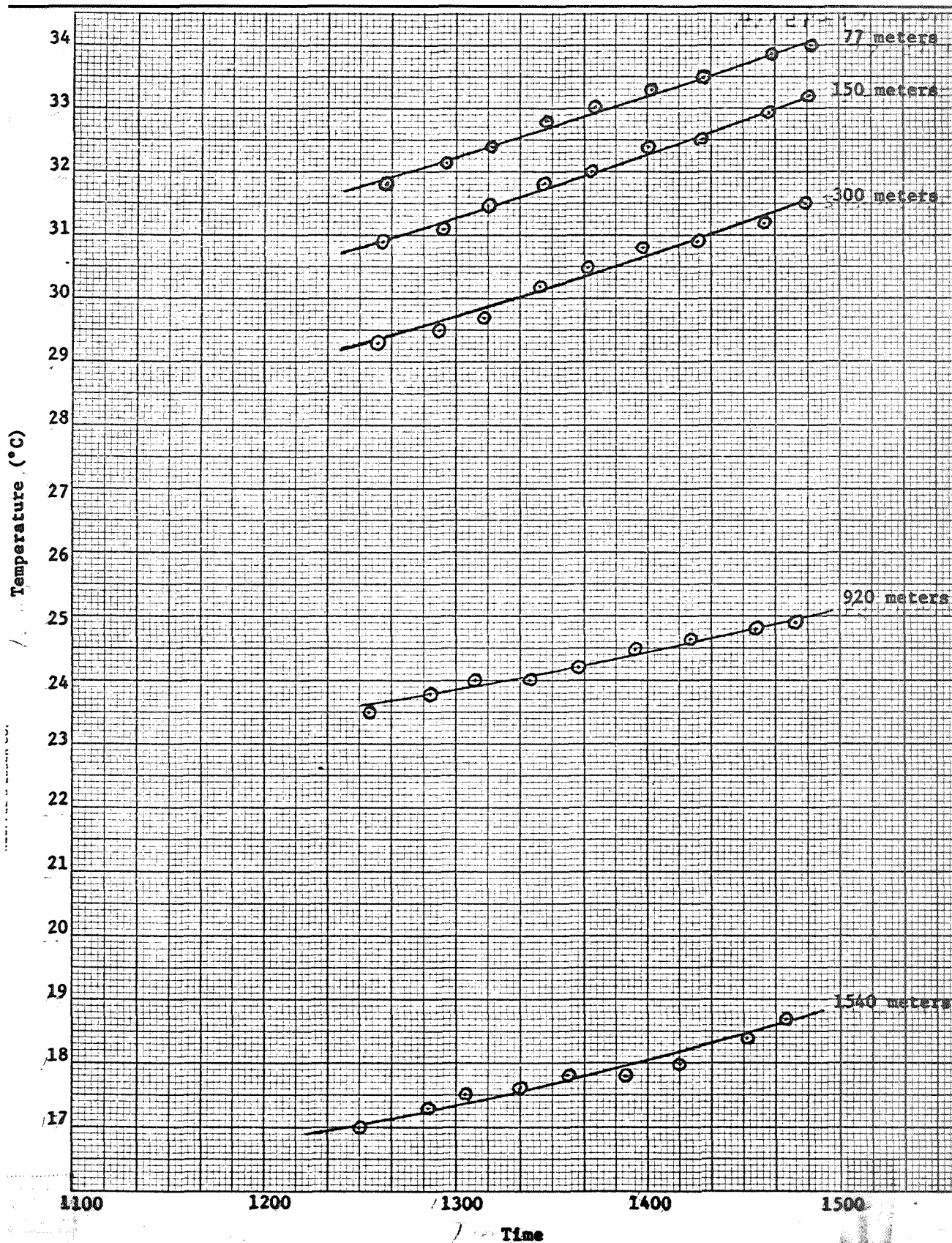
vs. Time



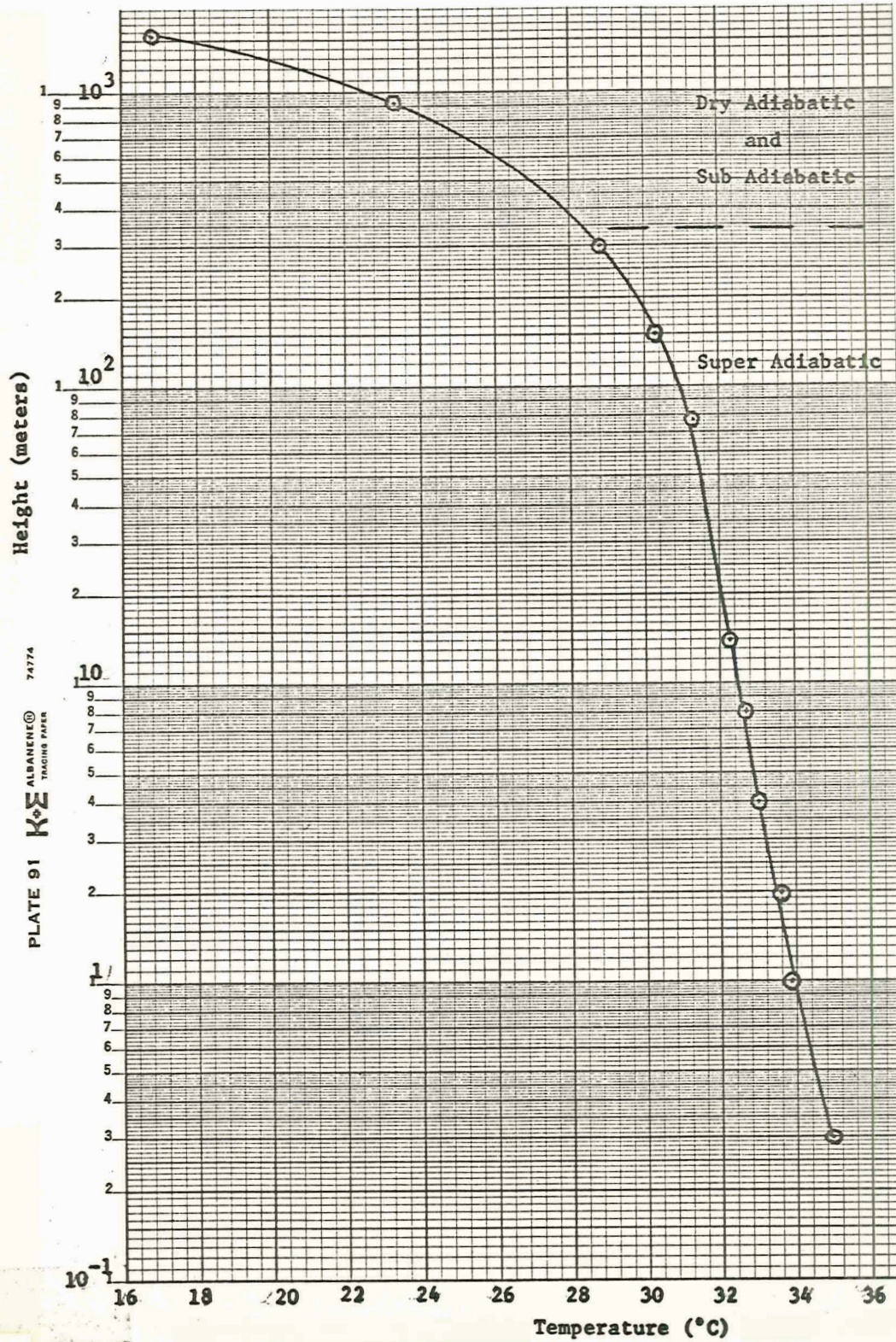
6-27-68

$\Delta T_s/h_s$ vs. Time

DATA FOR 7-25-68

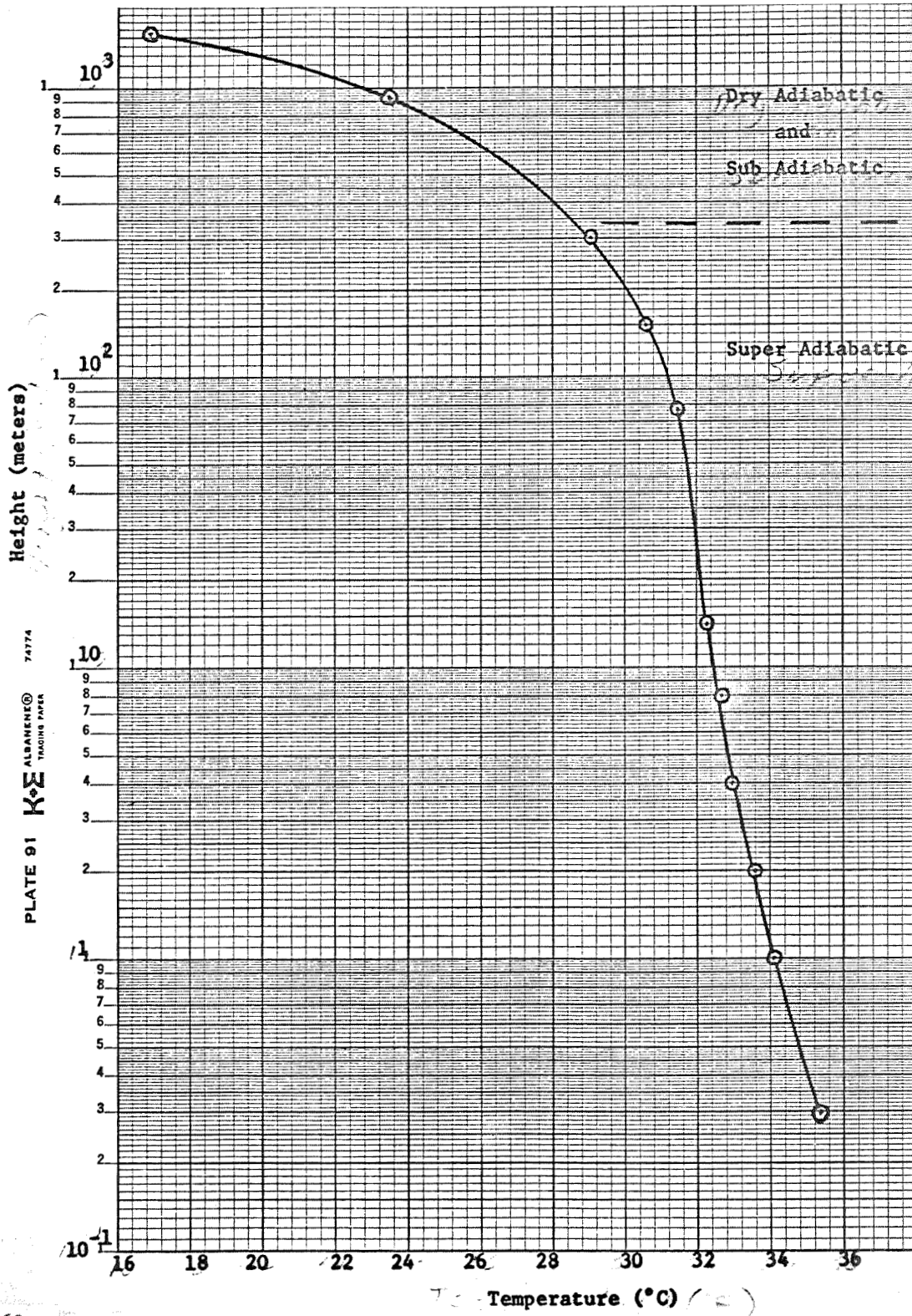


7-25-68 Aircraft Soundings



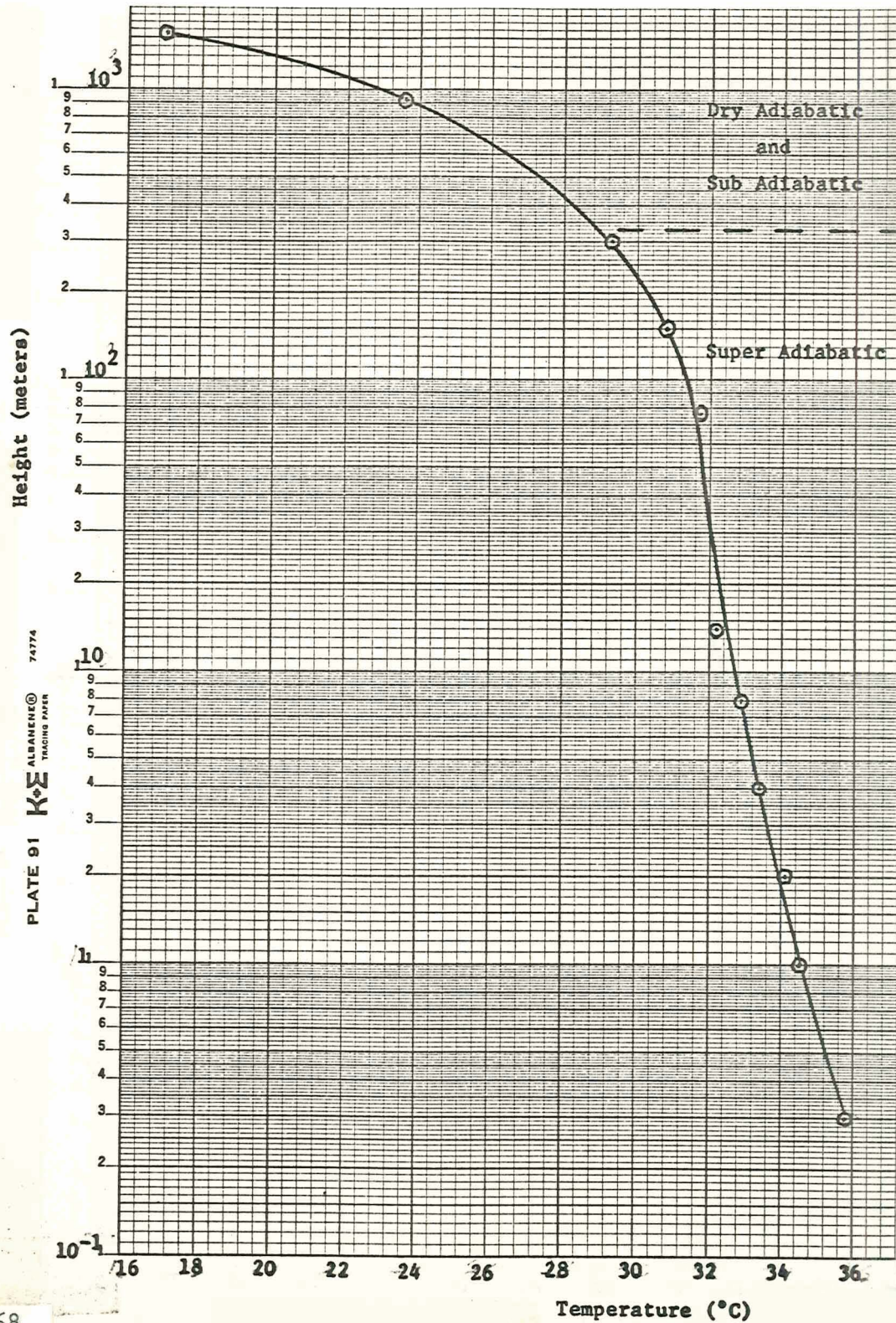
7-25-68

1200 PDT



7-25-68

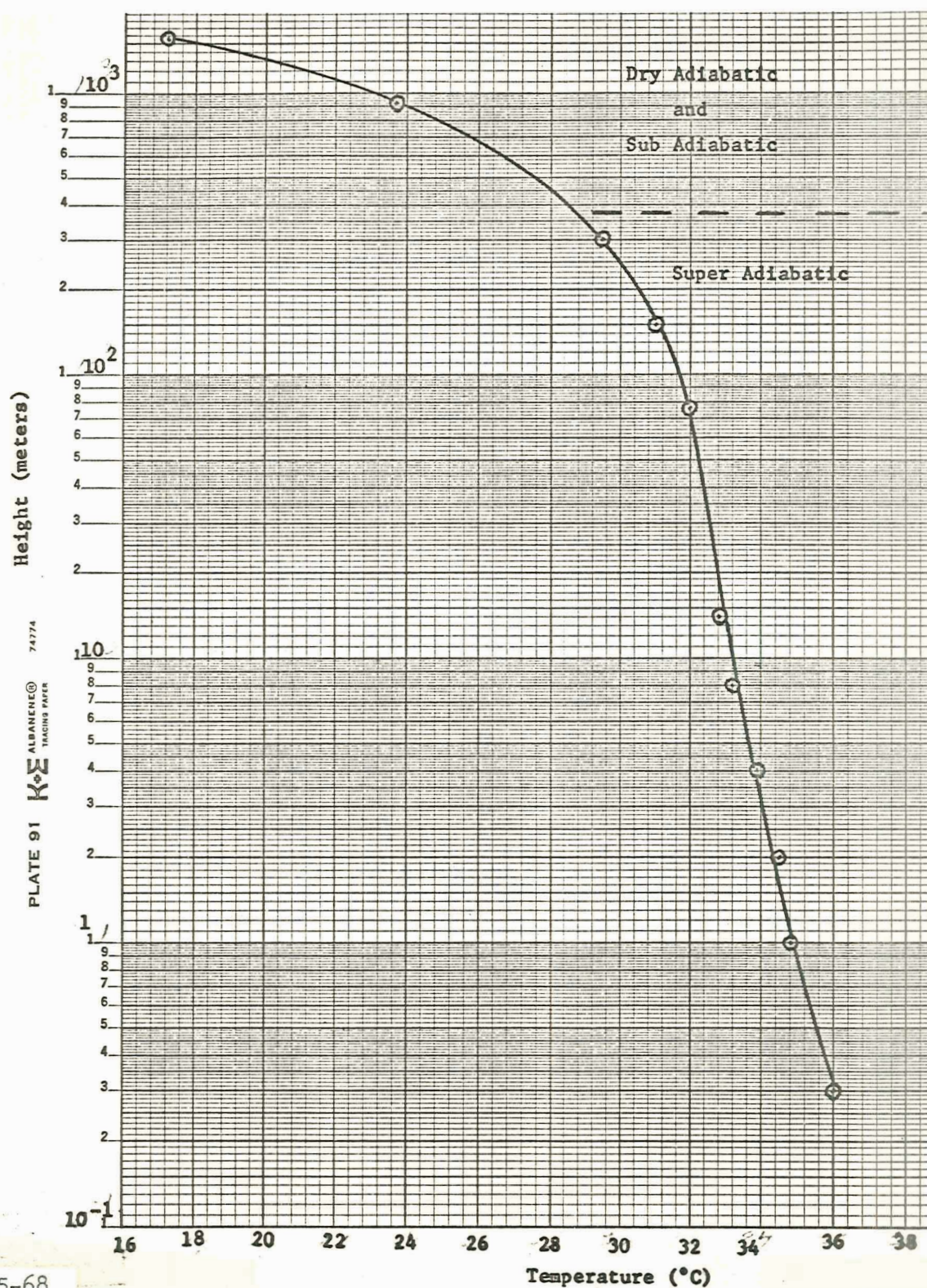
1215 PDT



7-25-68

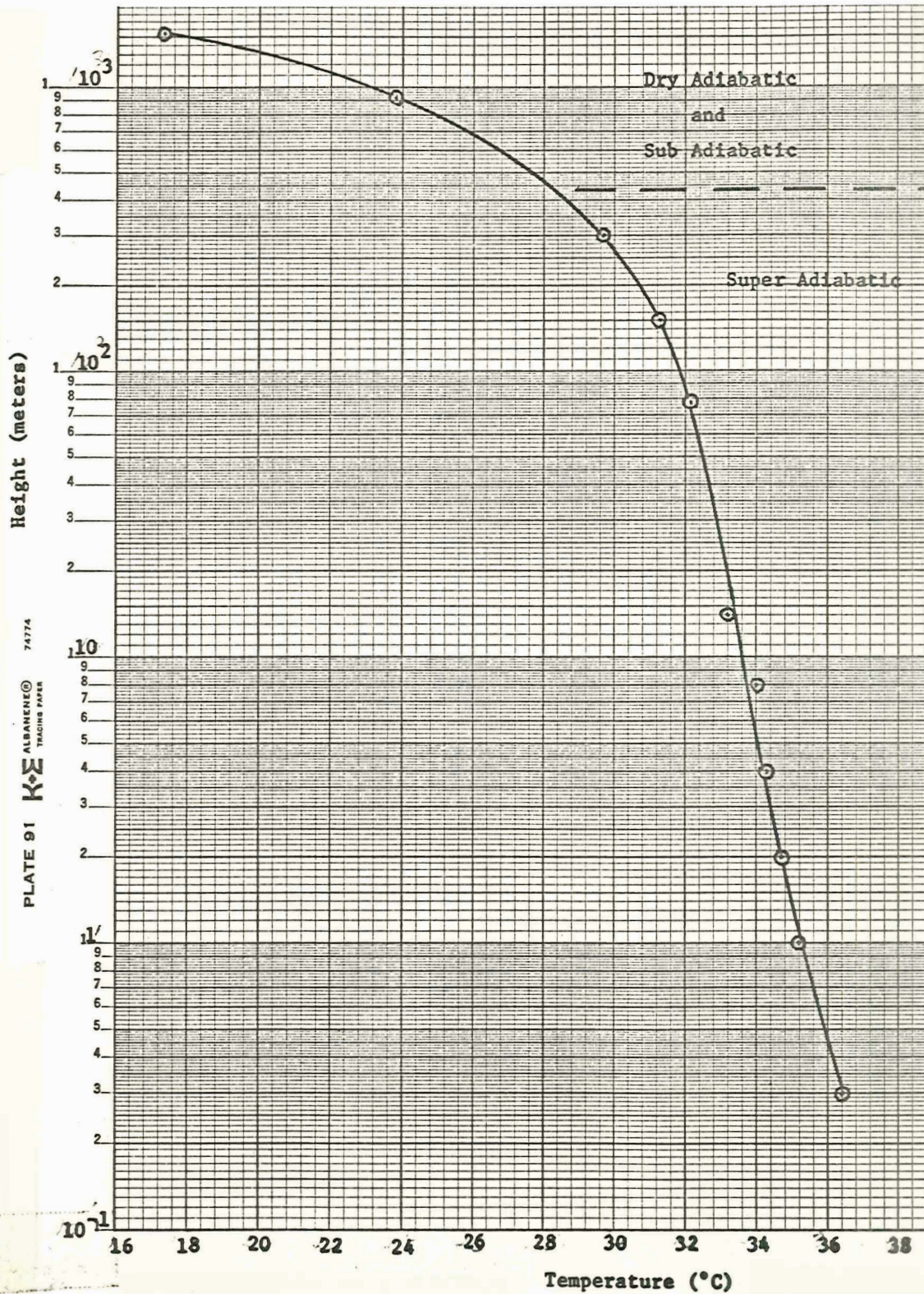
1230 PDT

M 30-692-6 (8-68)



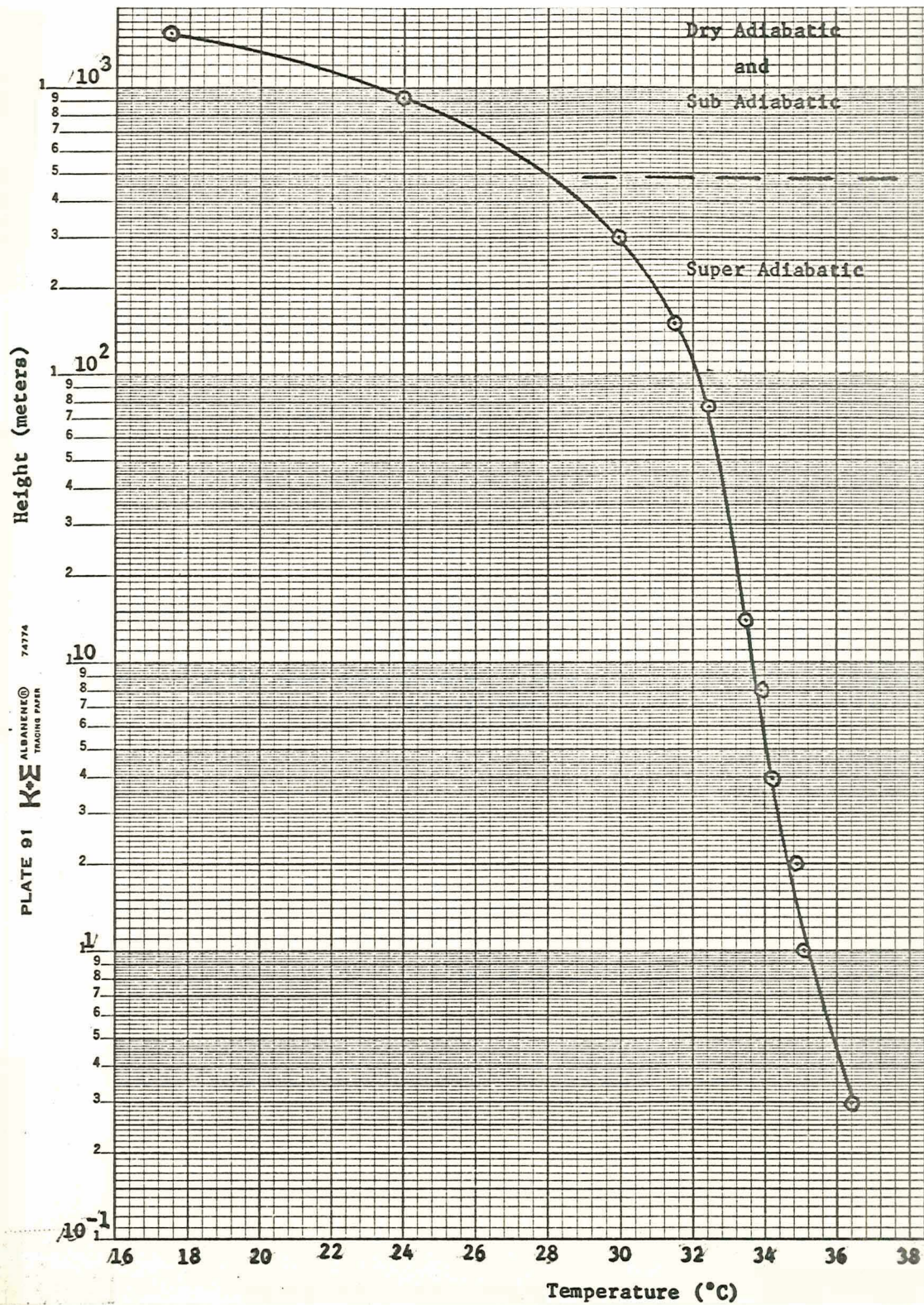
7-25-68

1245 PDT



7-25-68

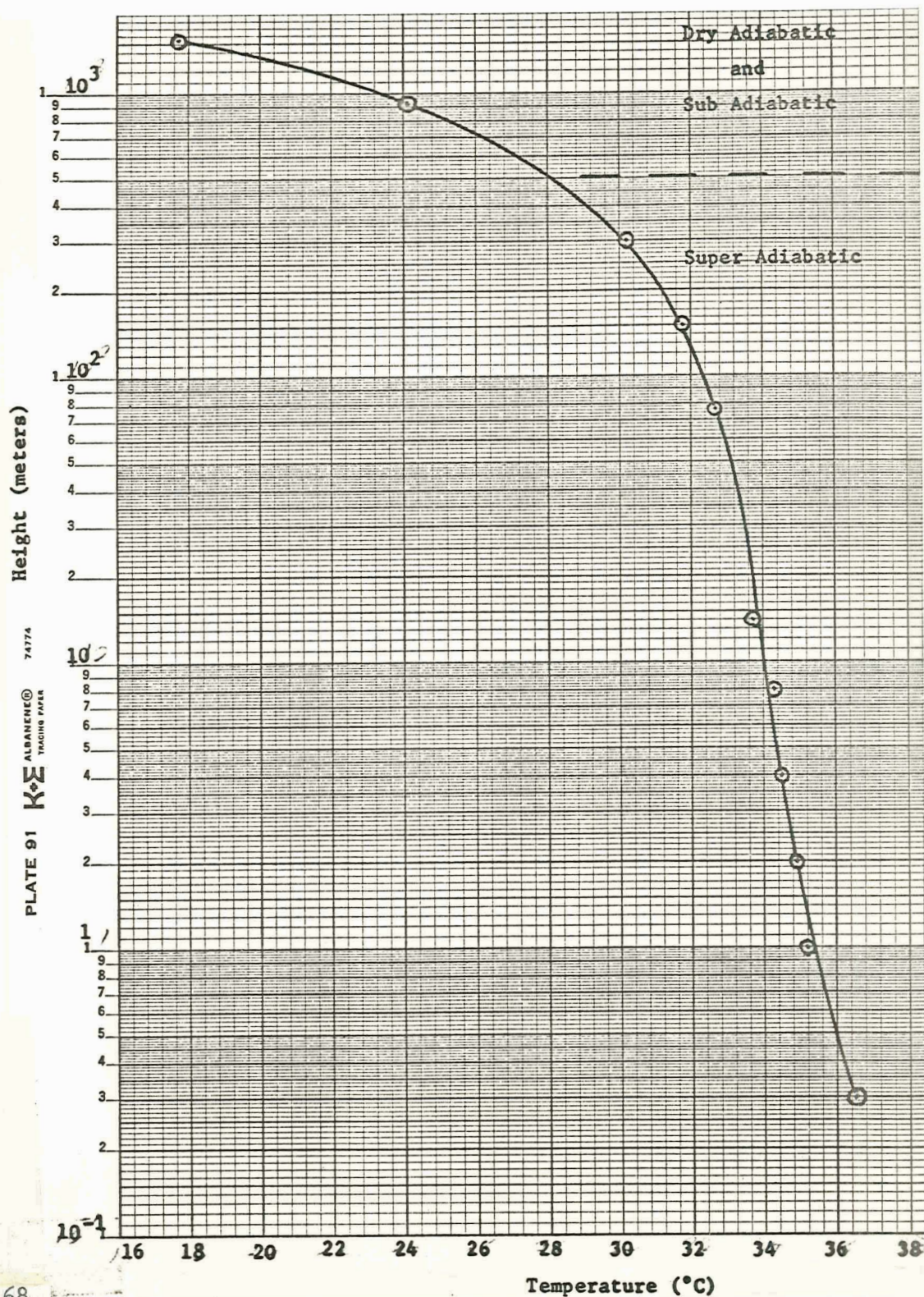
1300 PDT



7-25-68

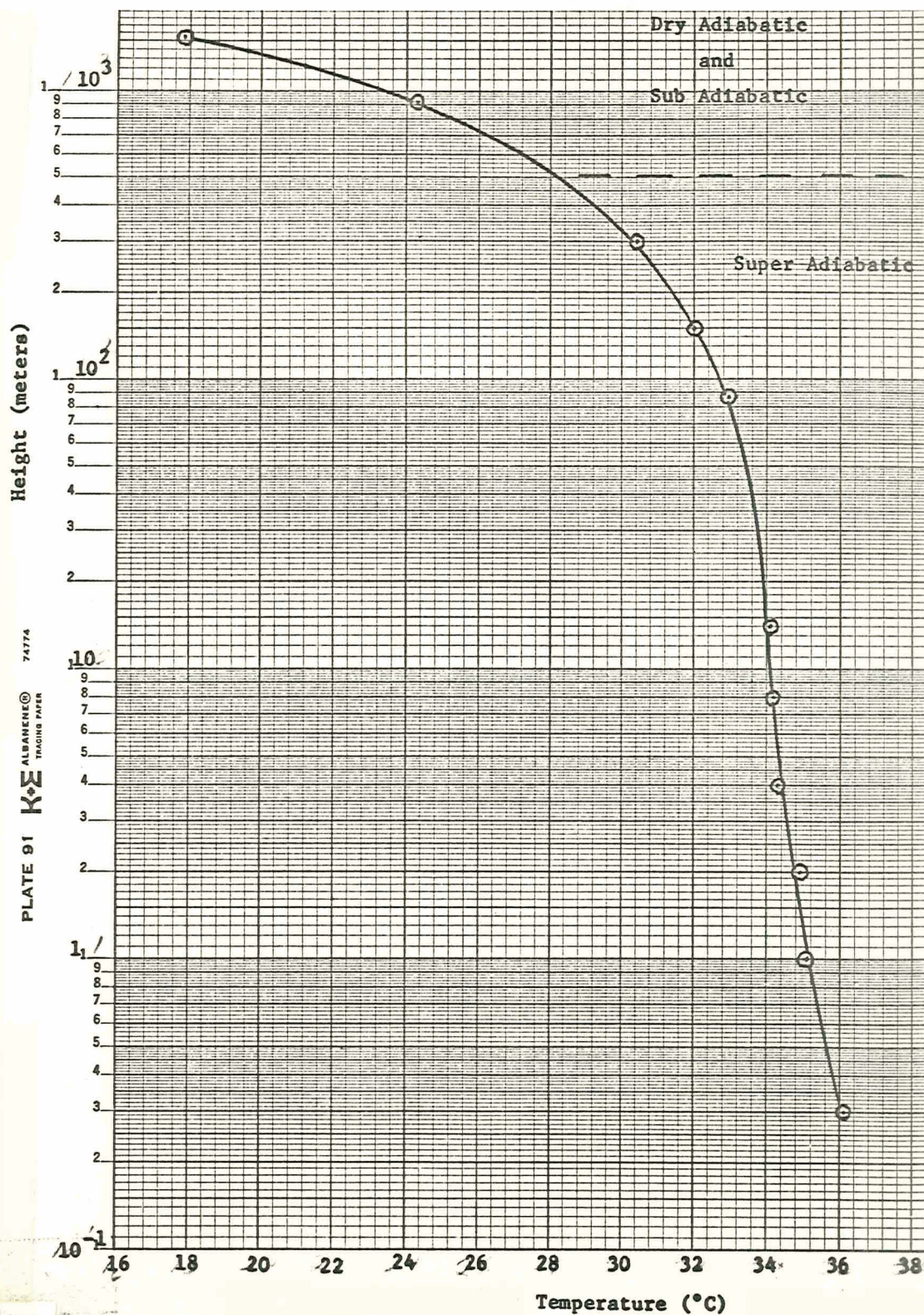
1315 PDT

30-692-6 (8-68)



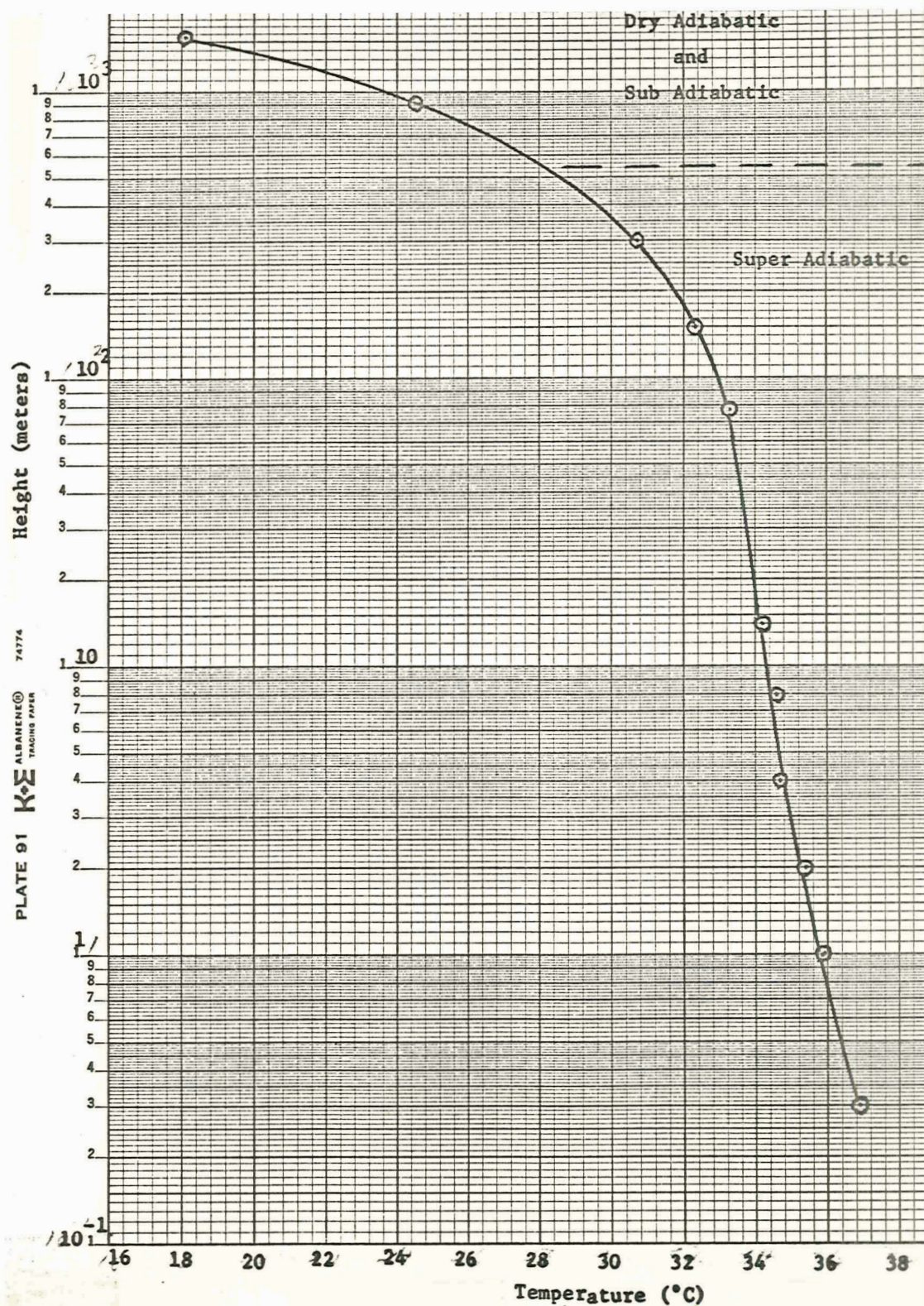
7-25-68

1330 PDT



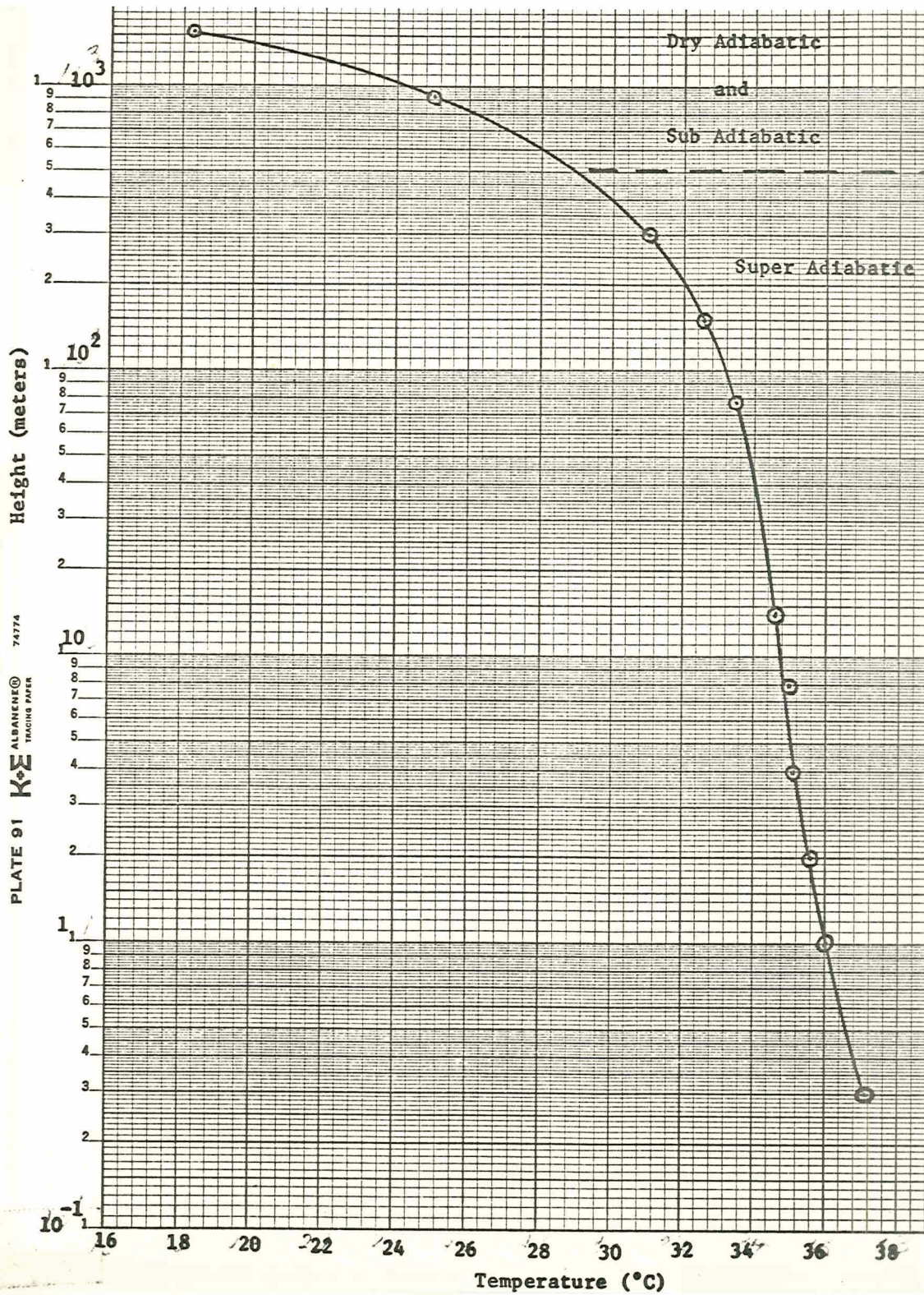
7-25-68

1345 PDT



7-25-68

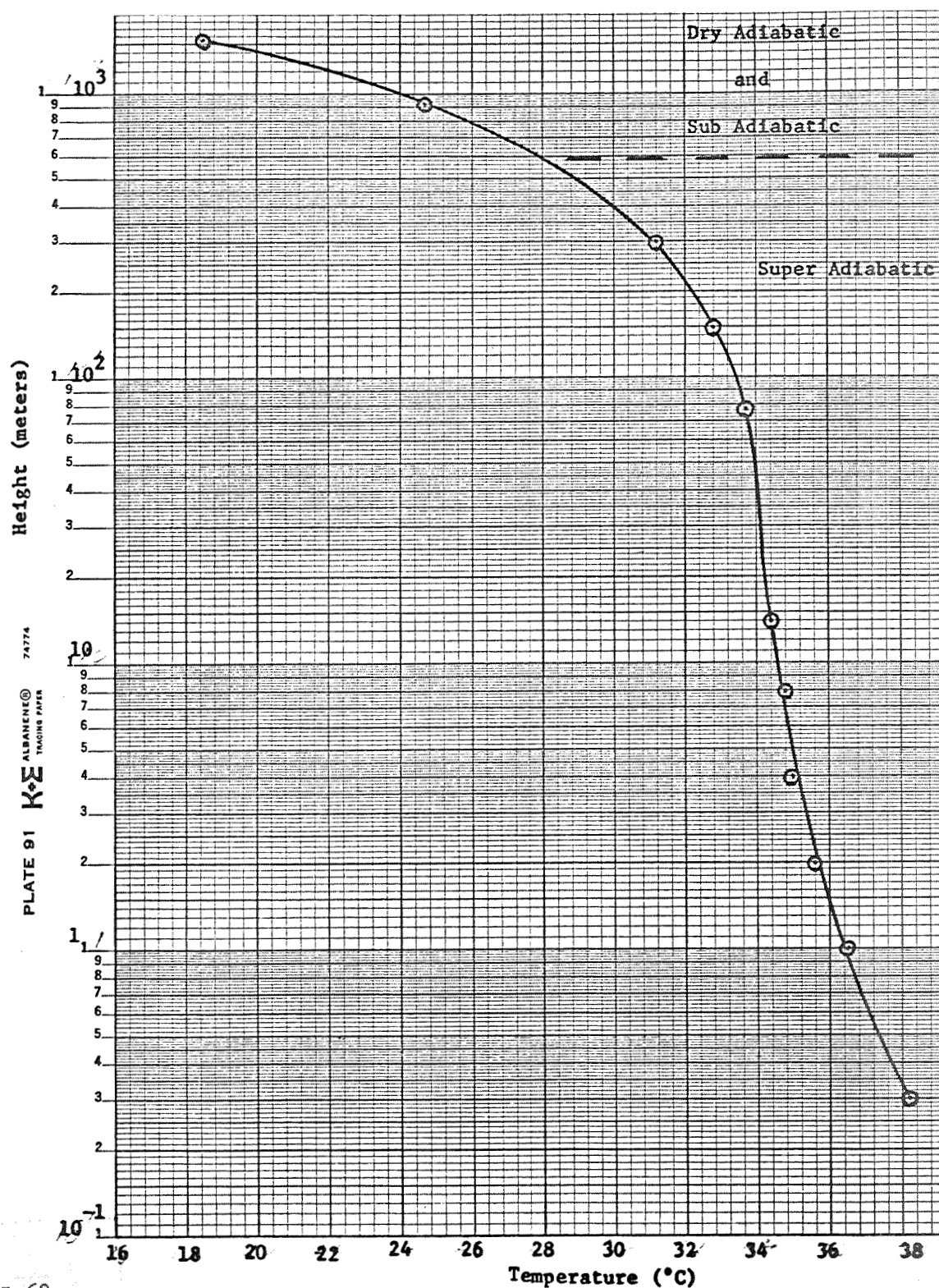
1405 PDT



7-25-68

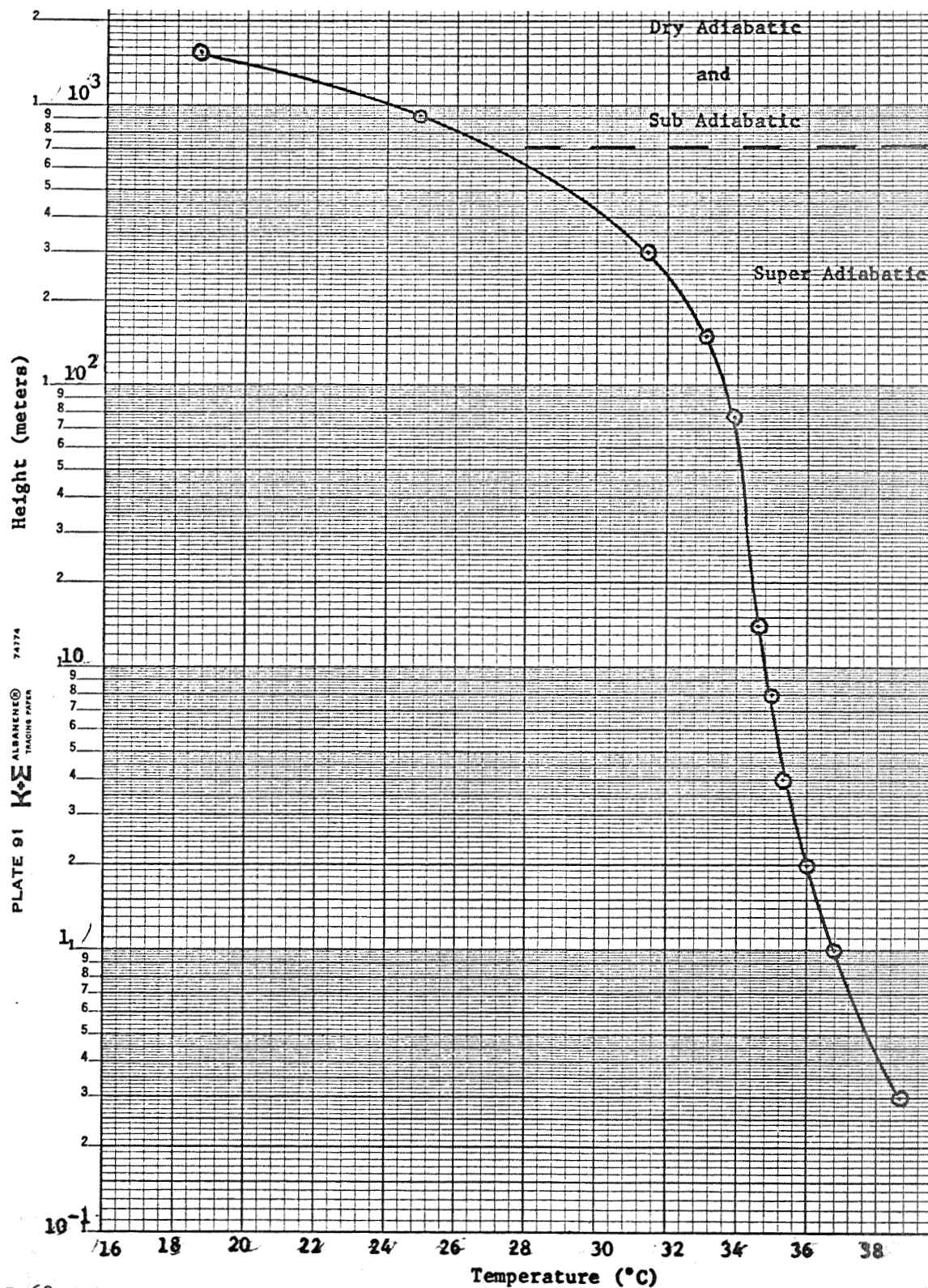
1420 PDT

1 30-692-6 (8-68)



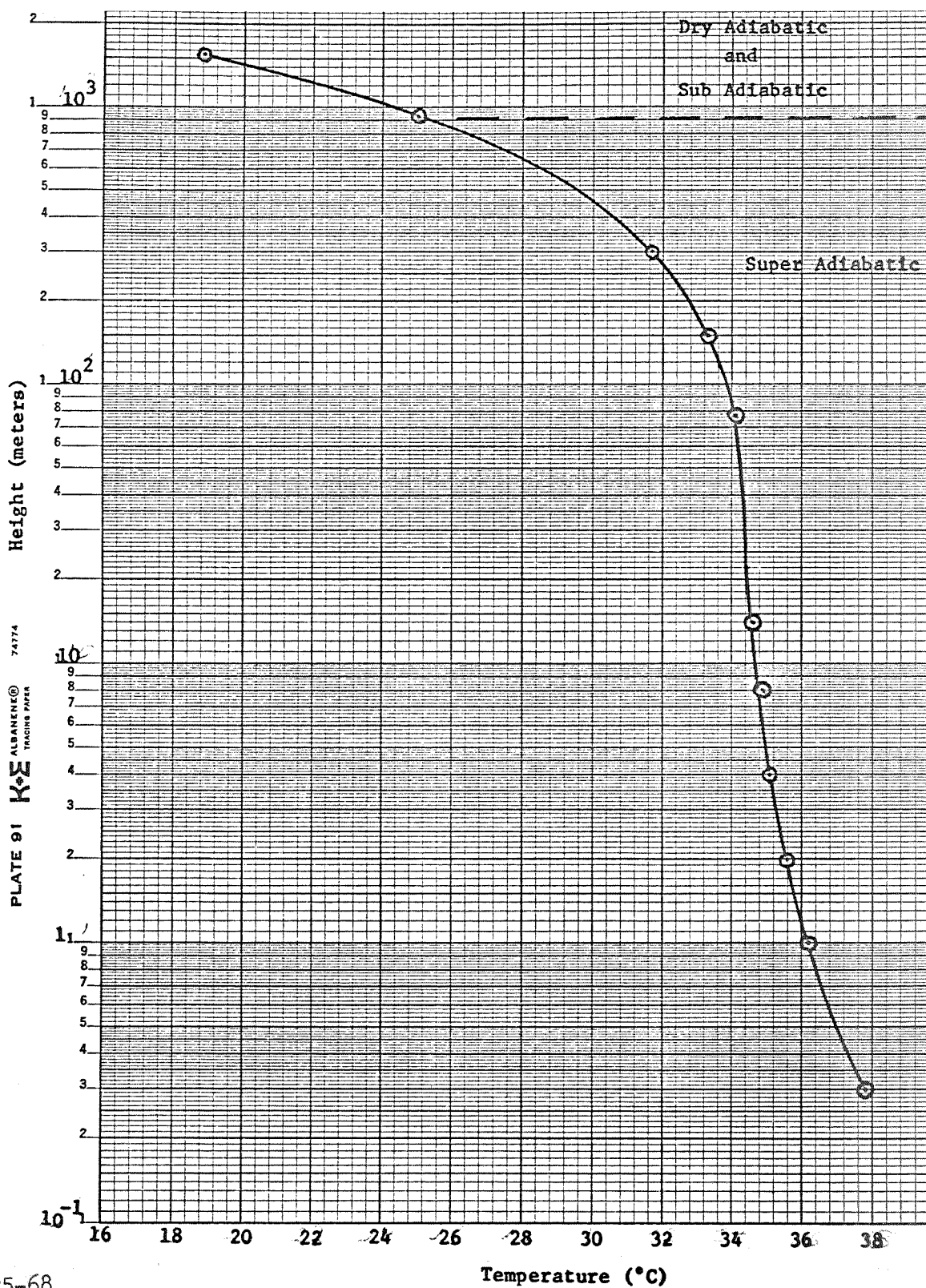
7-25-68

1430 PDT



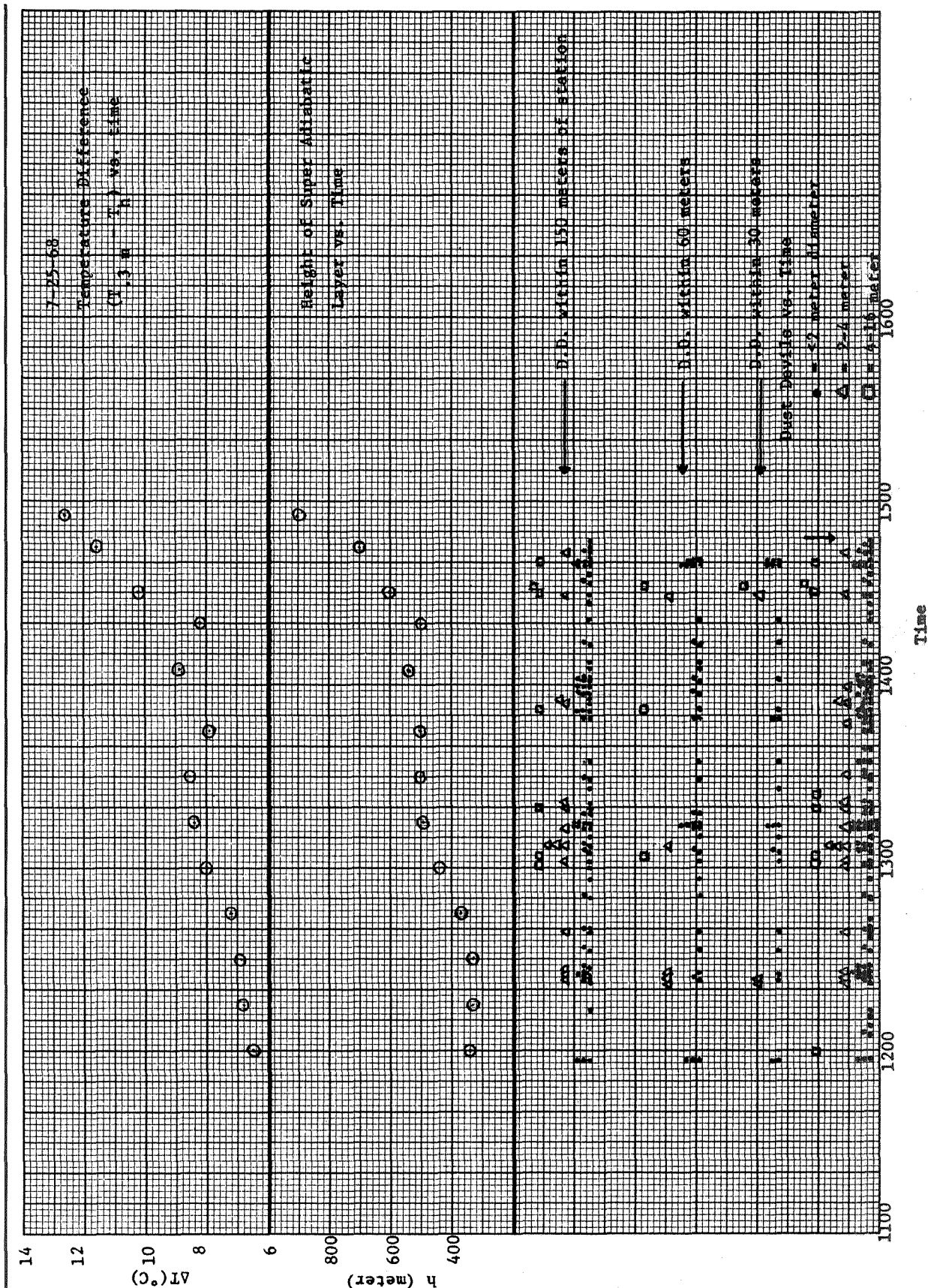
7-25-68

1445 PDT

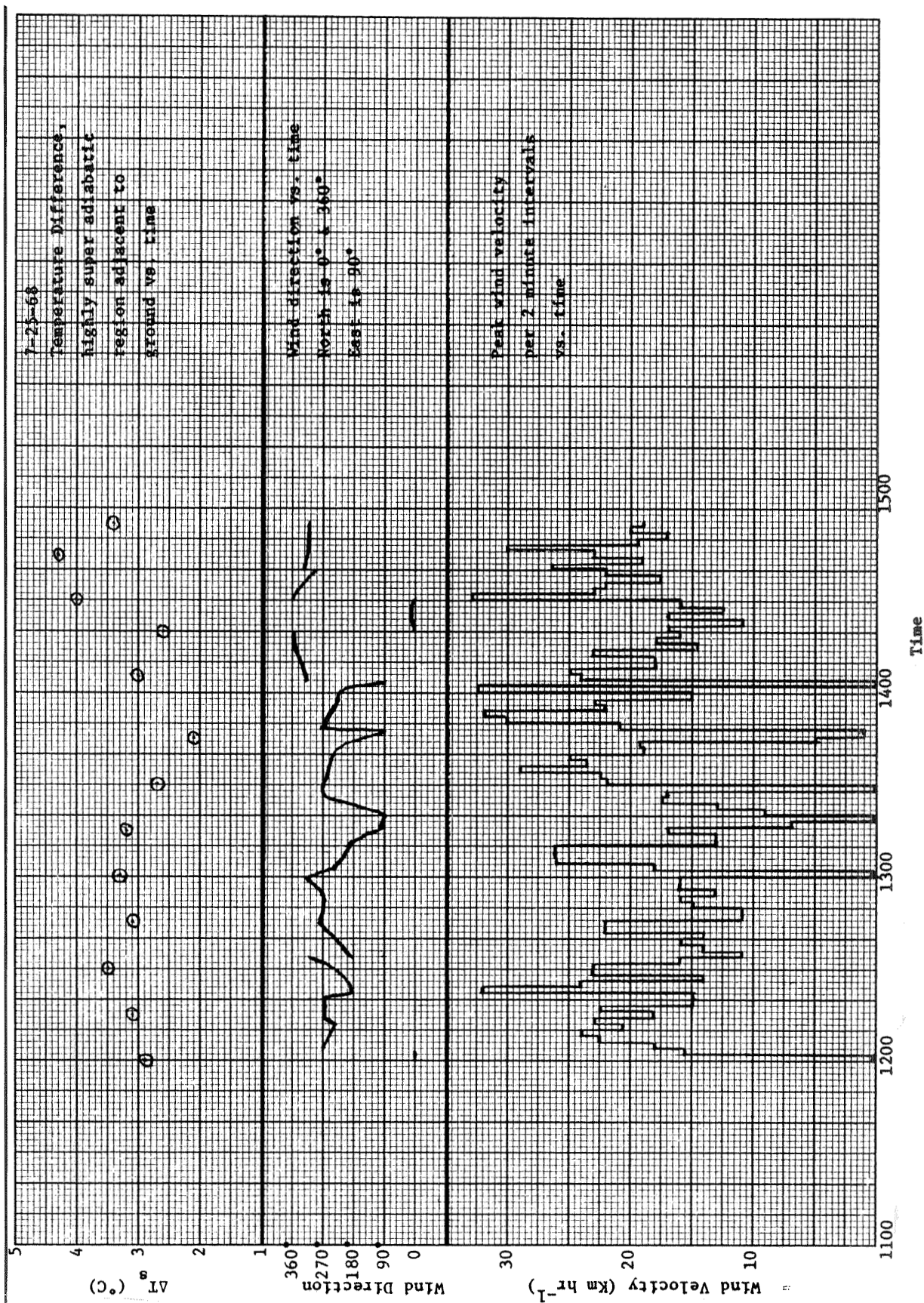


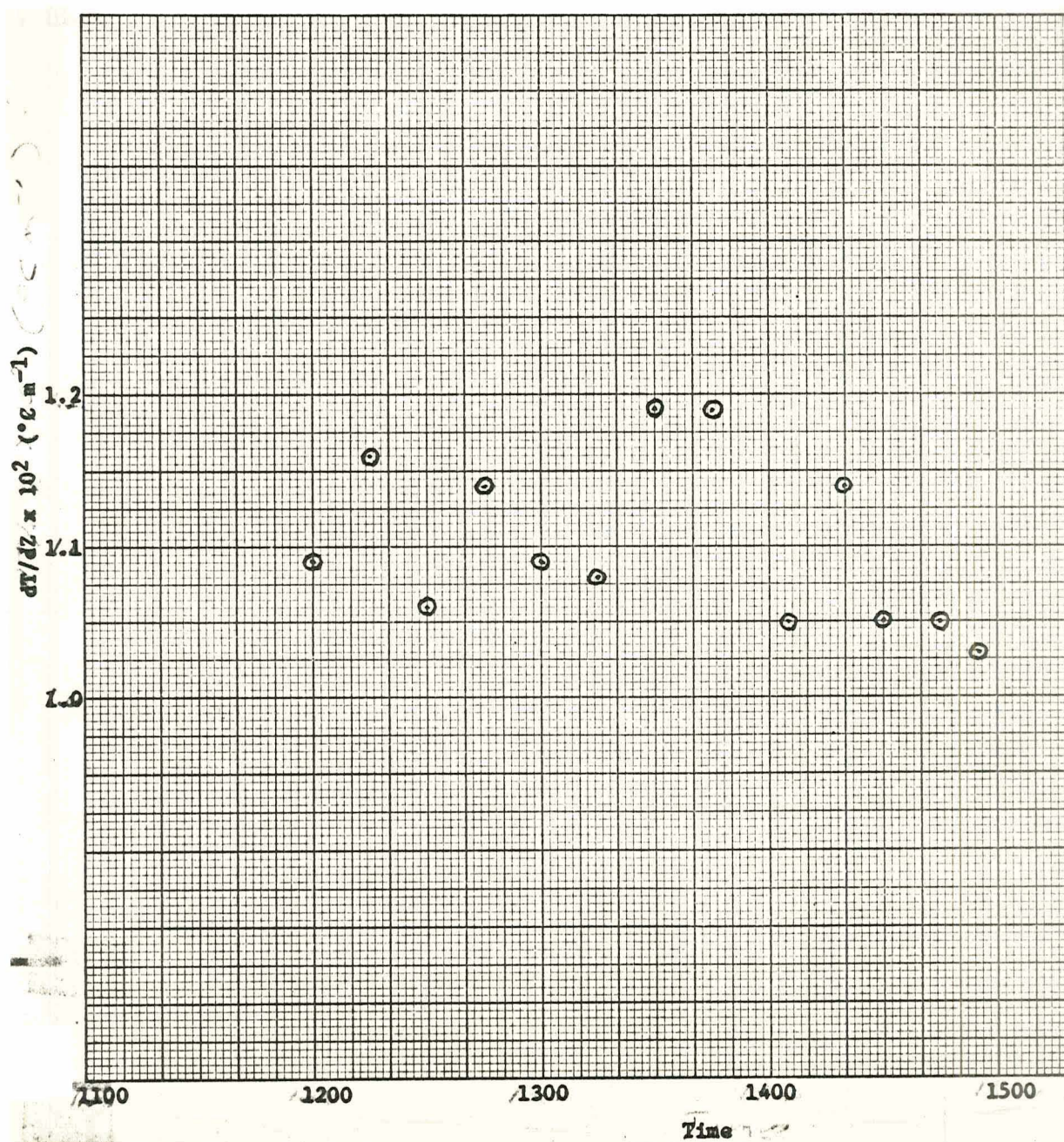
7-25-68

1455 PDT



30-692-9 (8-68)

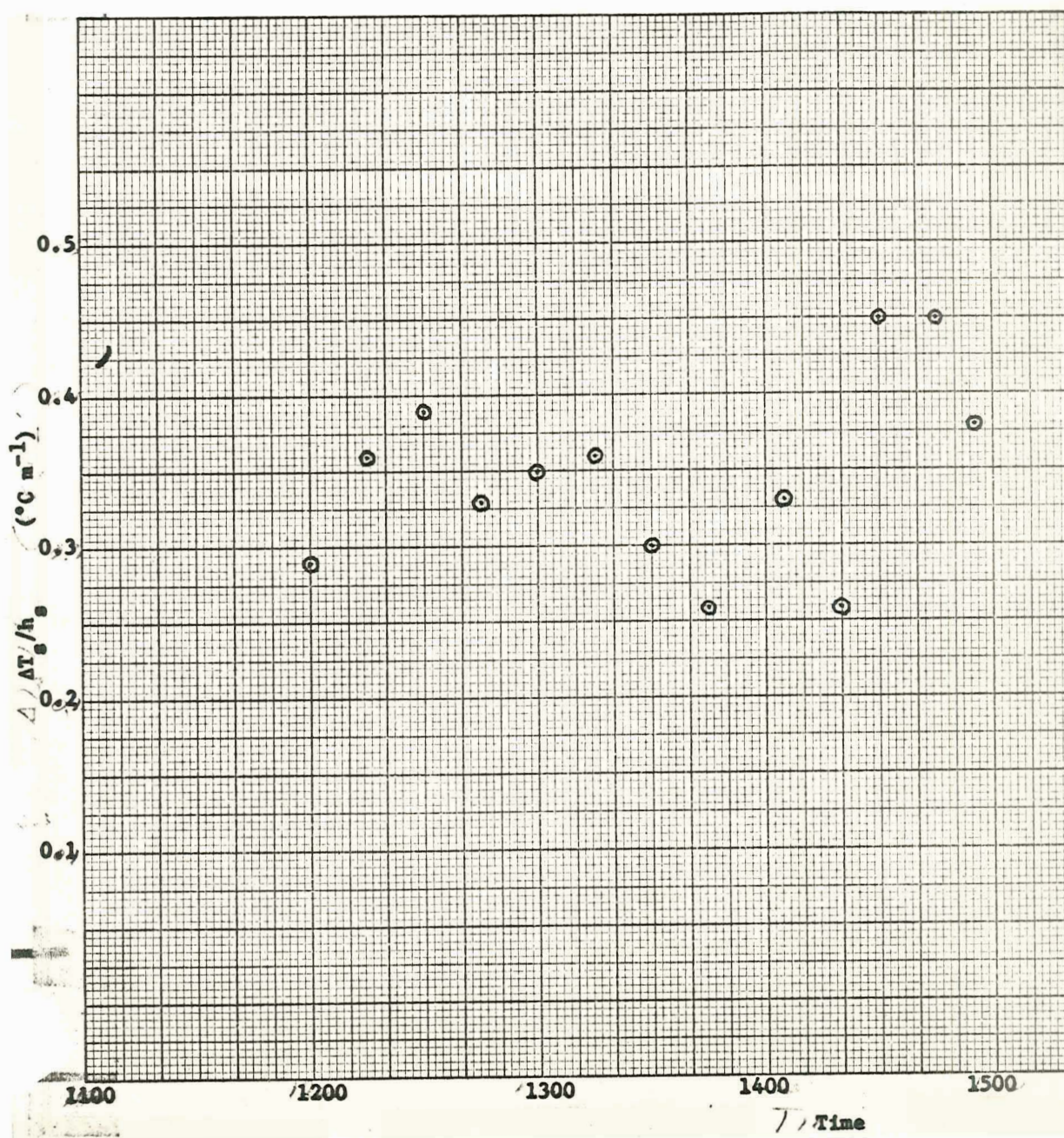




7-25-68

Lapse Rate (dT/dZ)

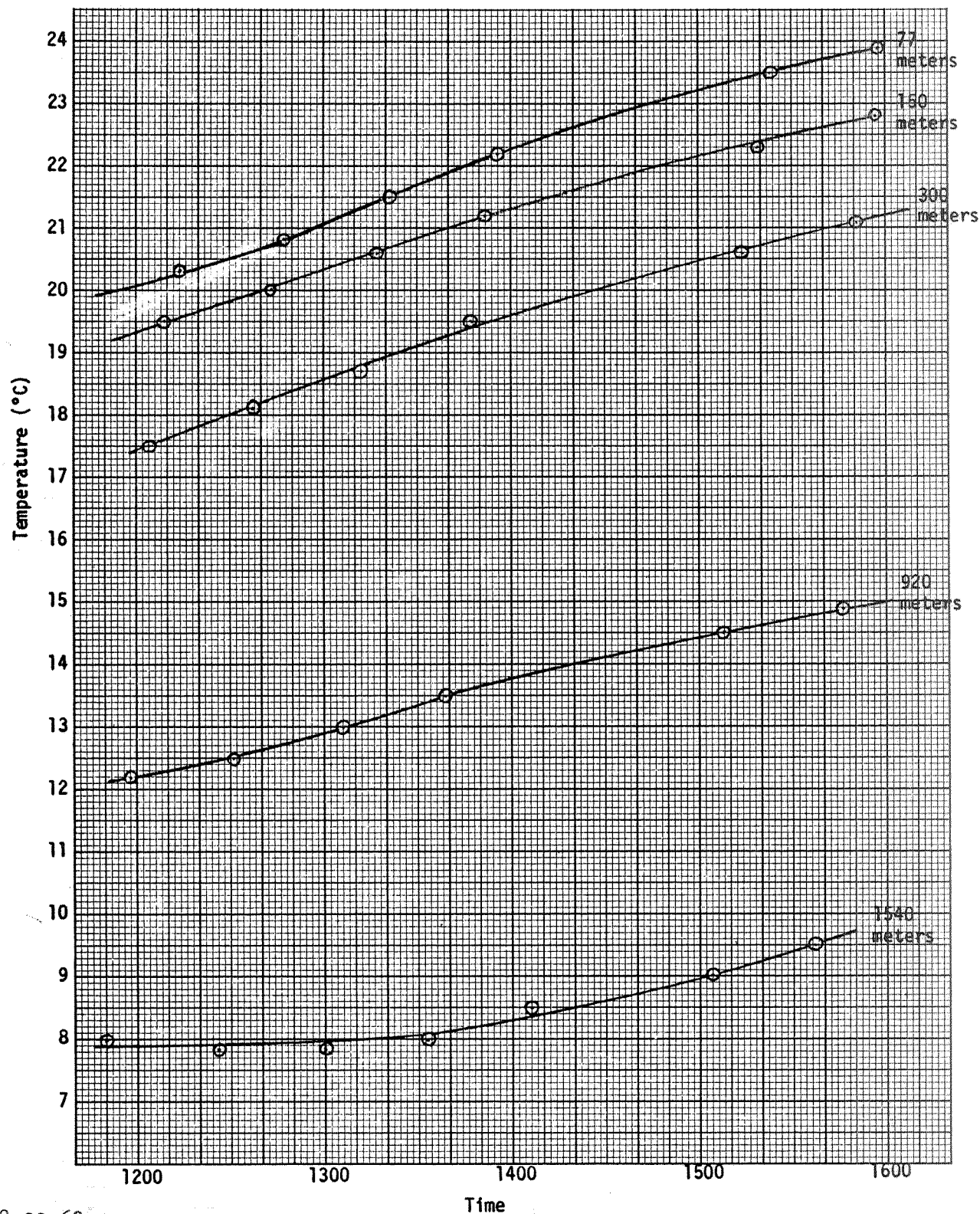
vs. Time



7-25-68

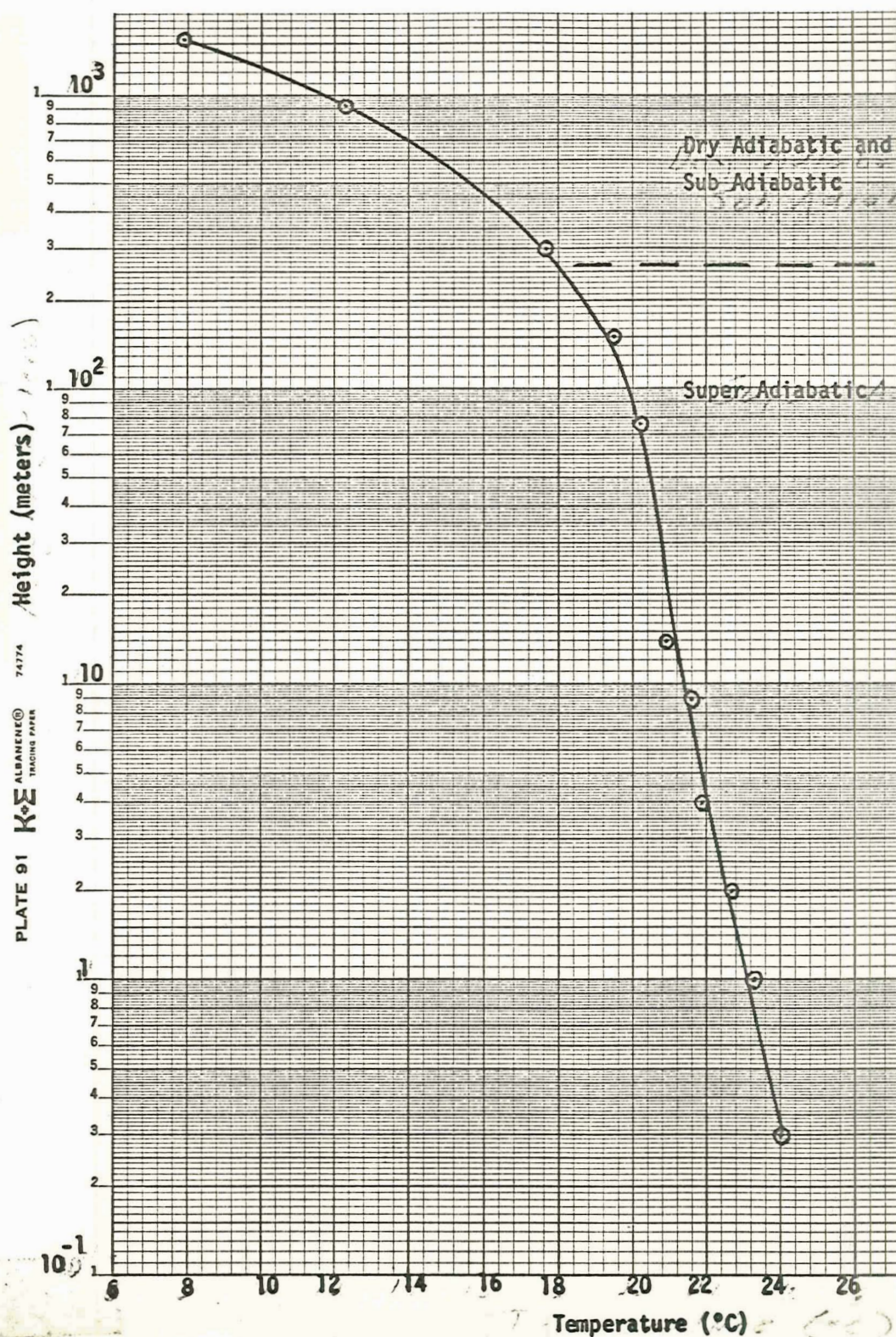
$\Delta T_s/h_s$ vs. Time

DATA FOR 8-22-68



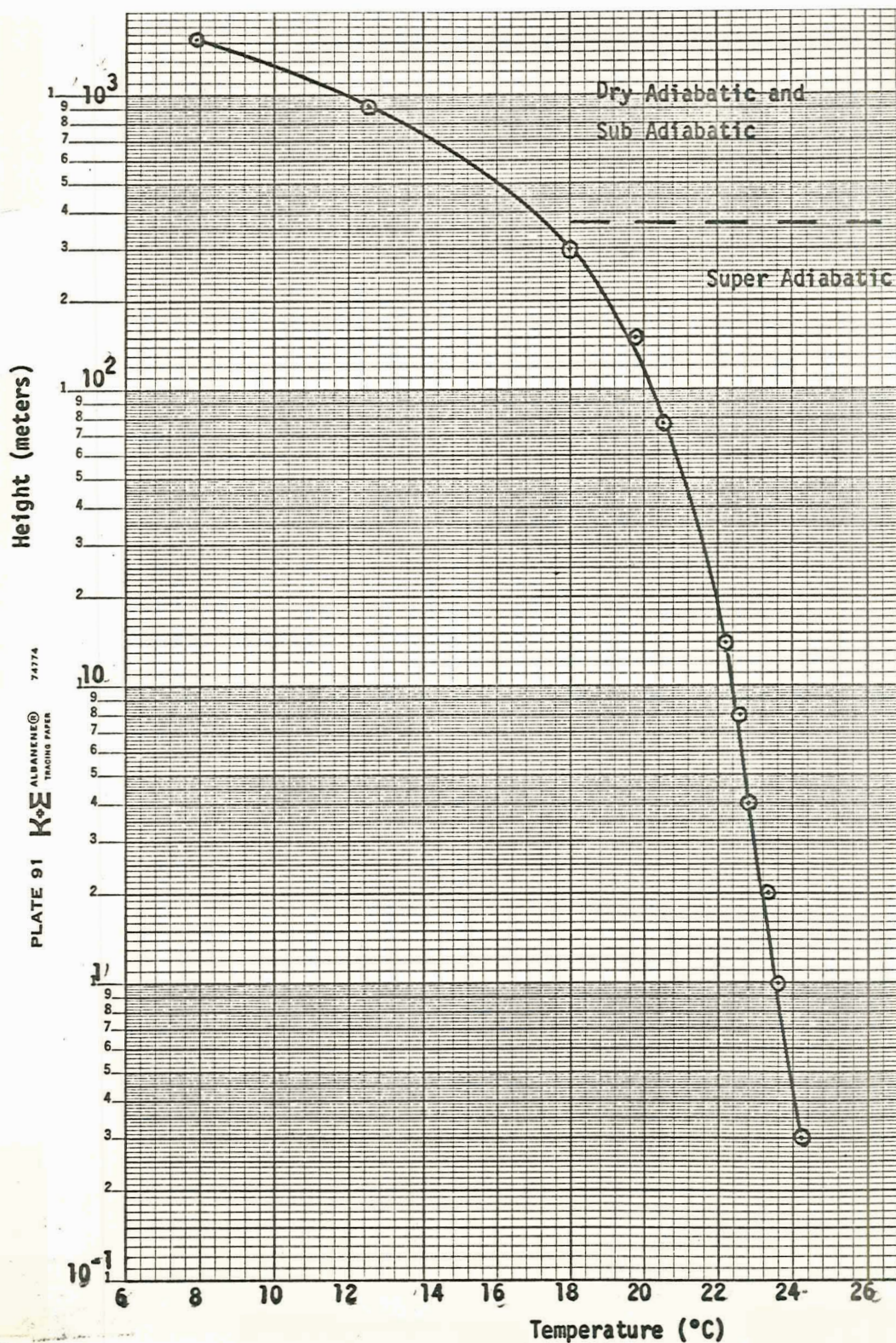
8-22-68

Aircraft Soundings



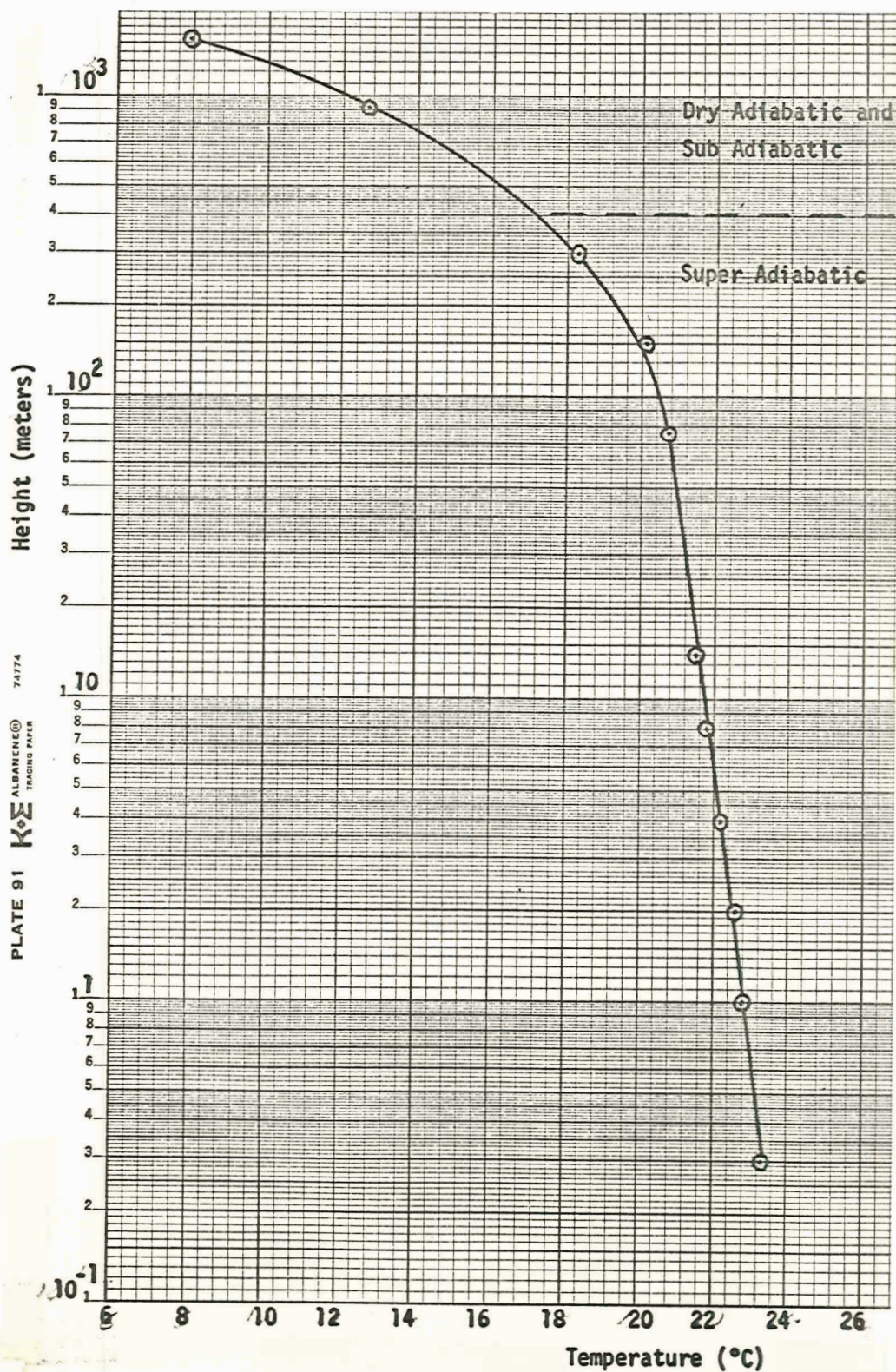
8-22-68

1210 PDT



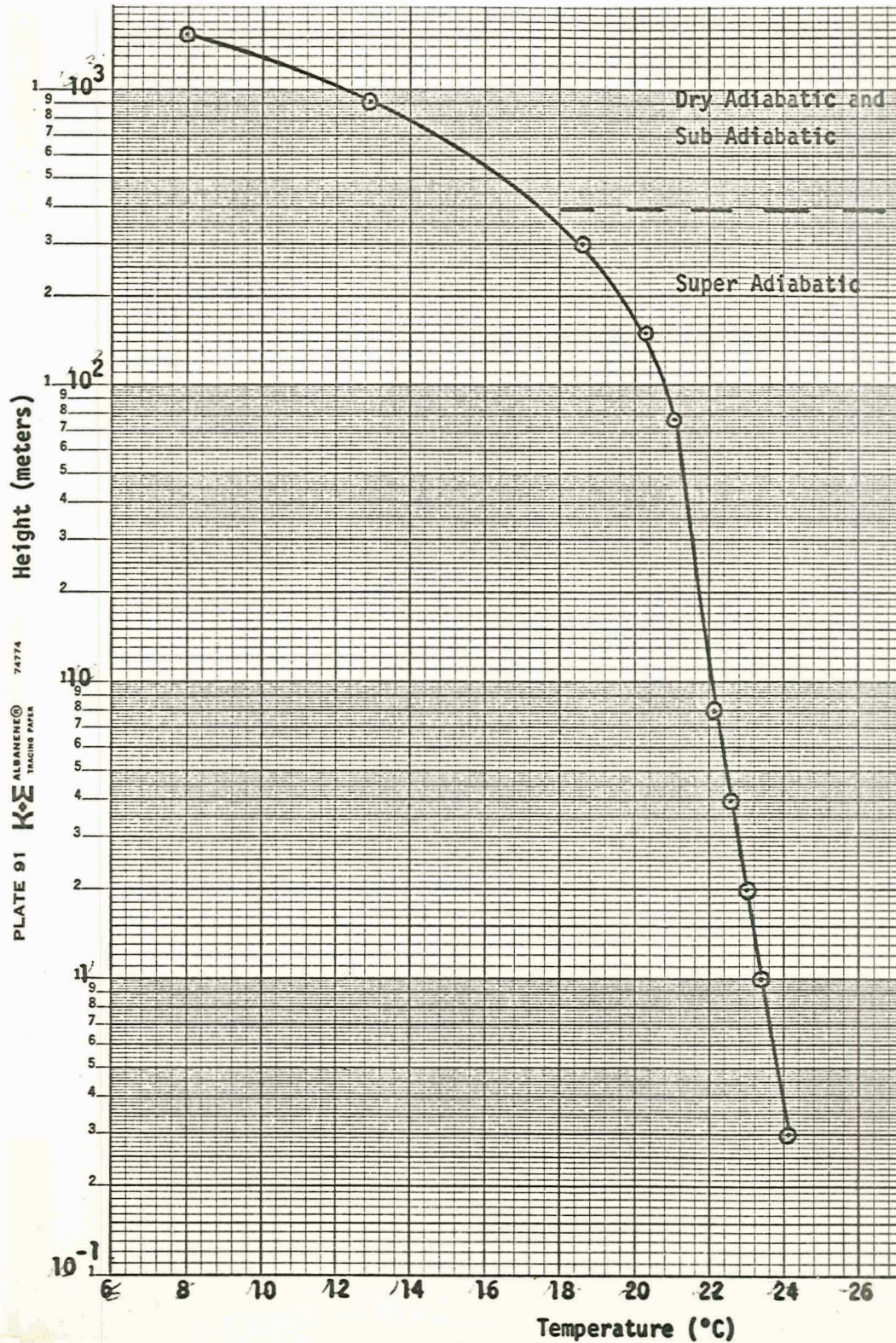
8-23-68

1230 PDT



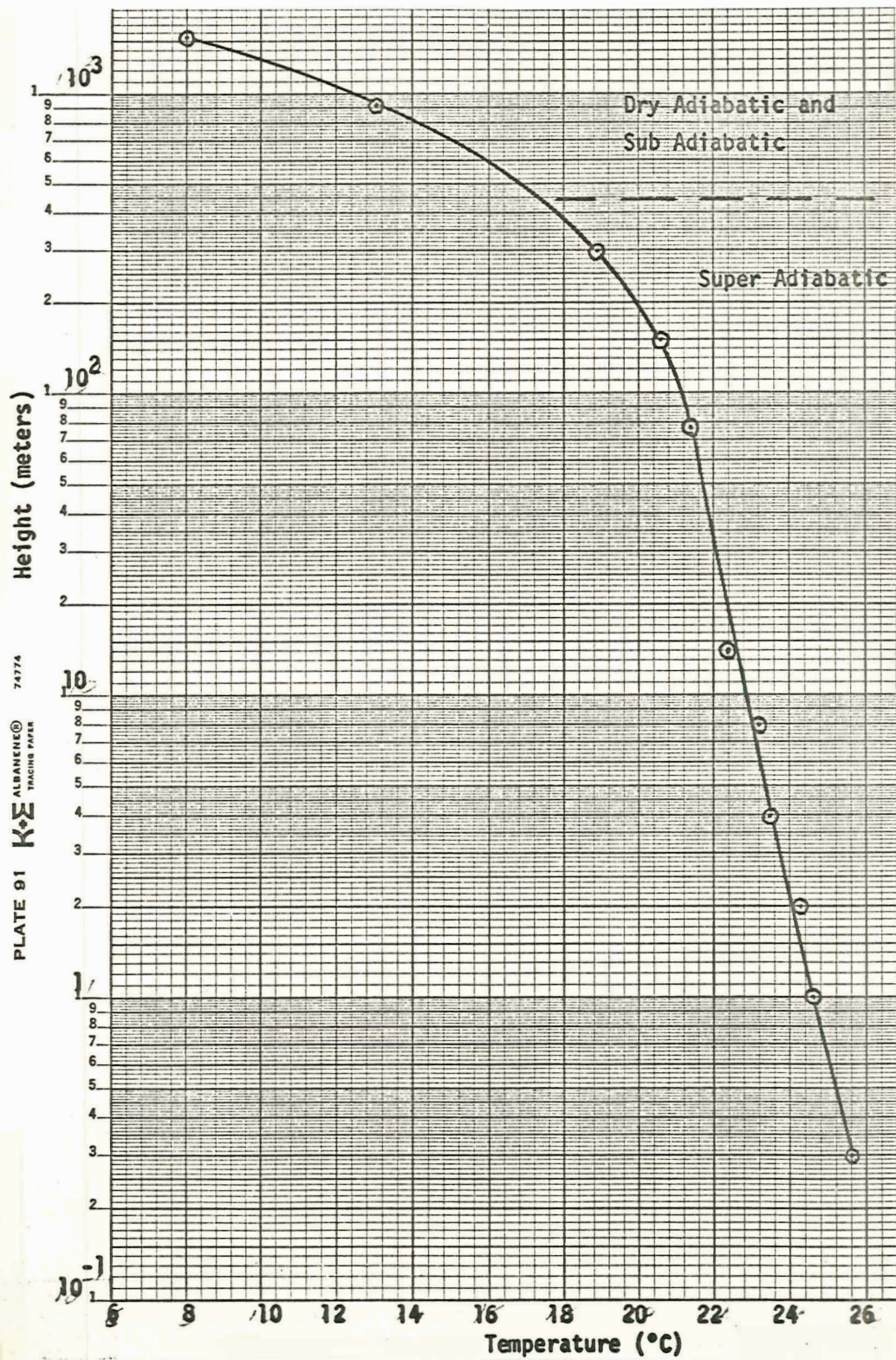
8-22-68

1245 PDT



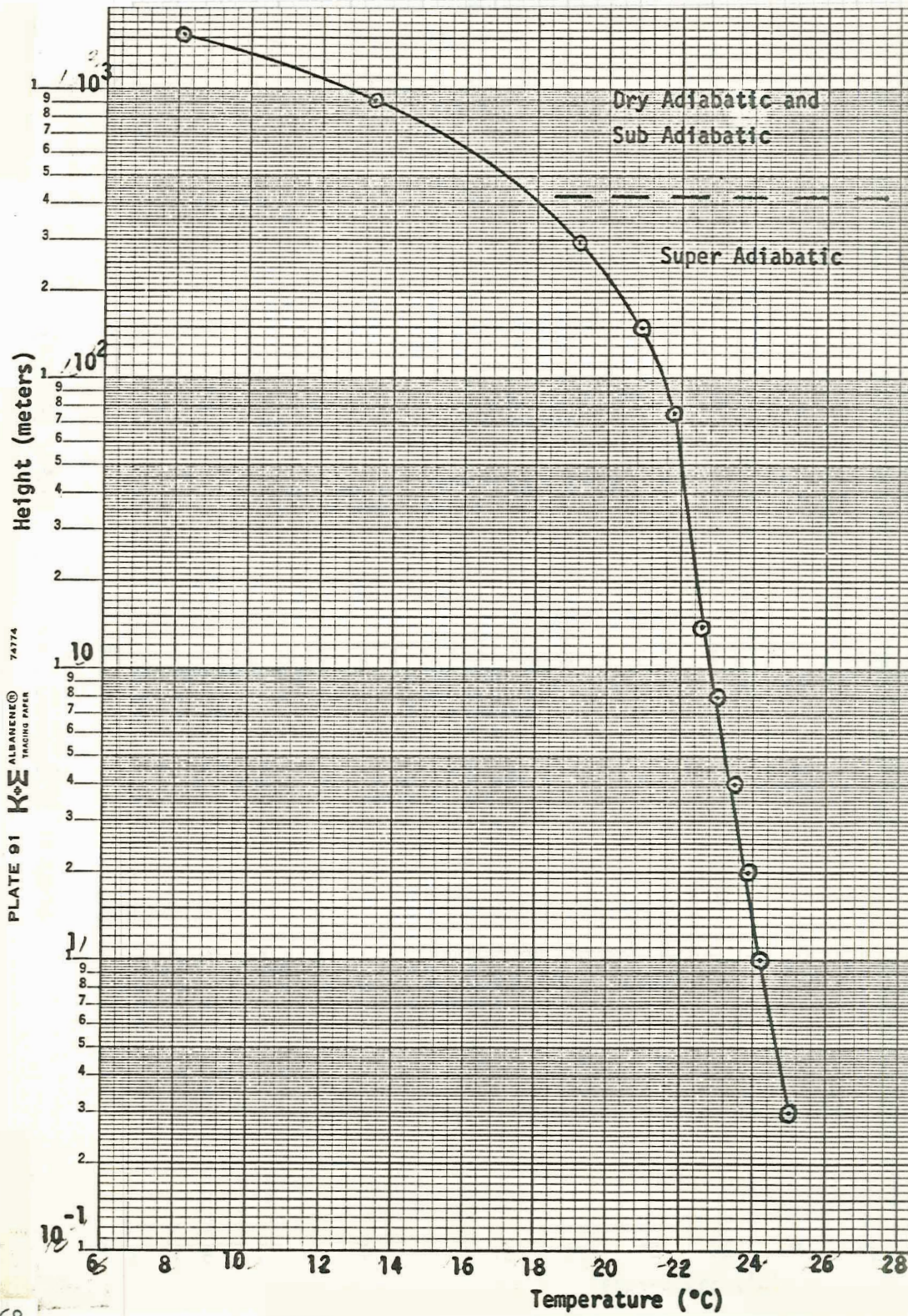
8-22-68

1300 PDT



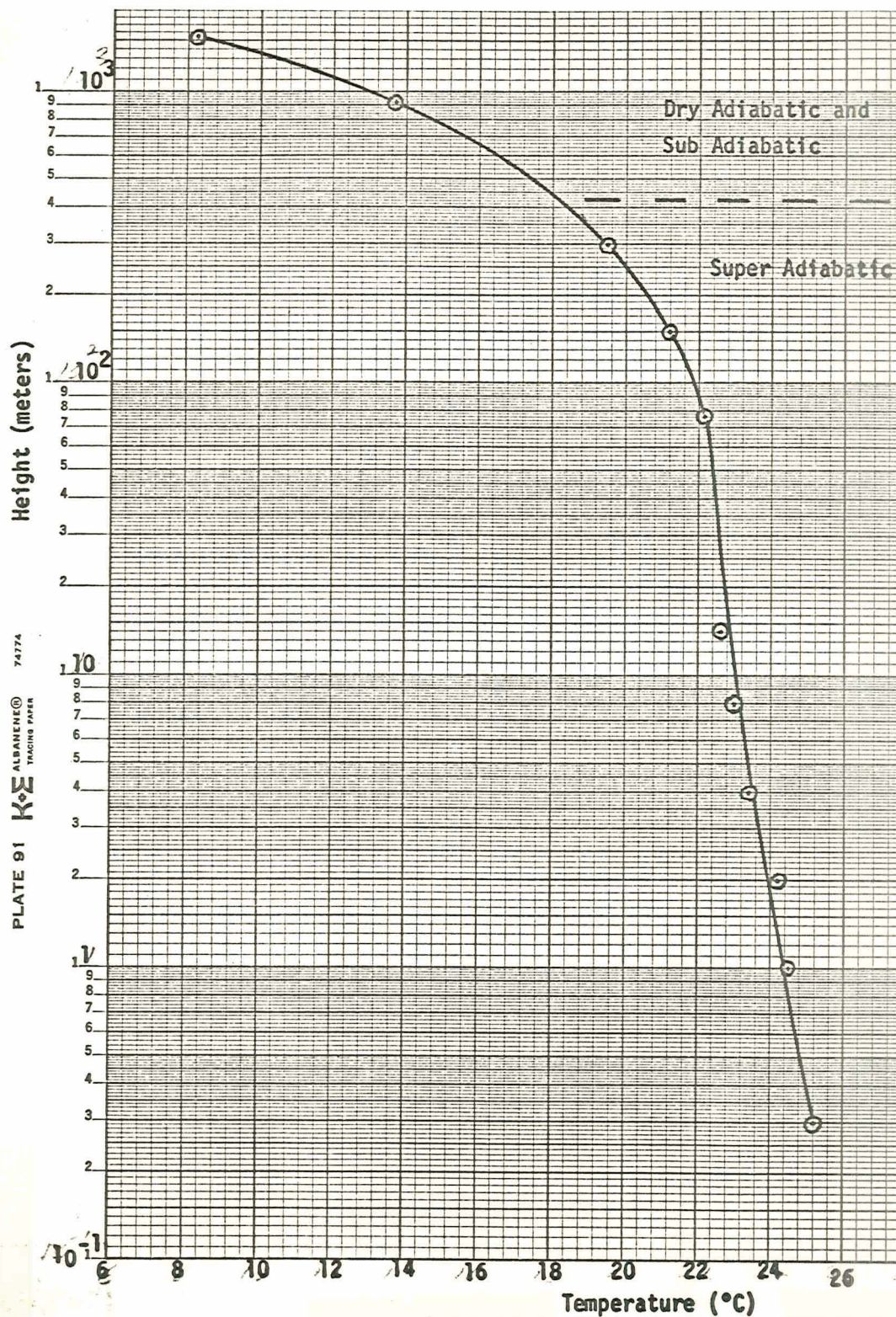
8-22-68

1315 PDT



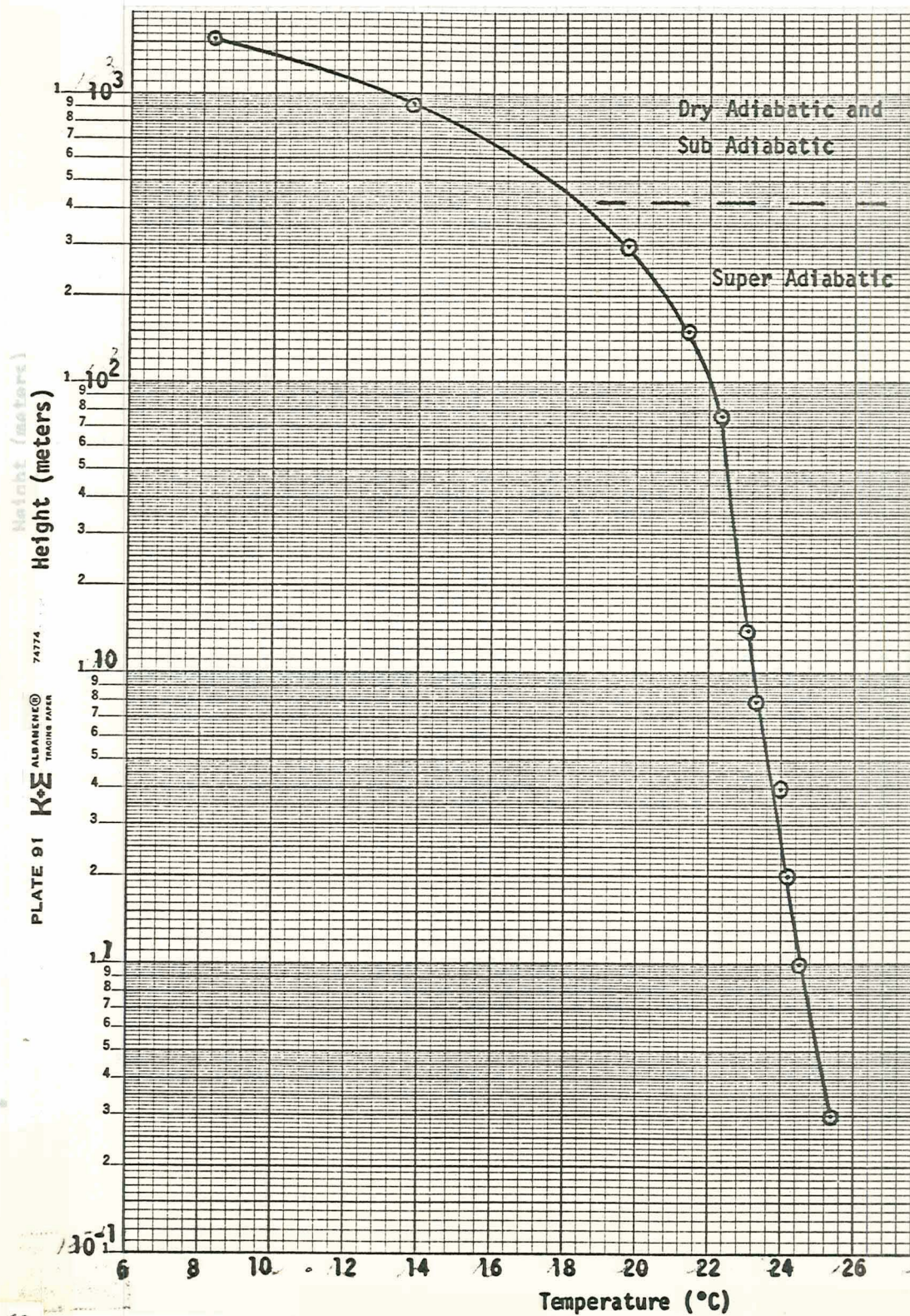
8-22-68

1335 PDT



8-22-68

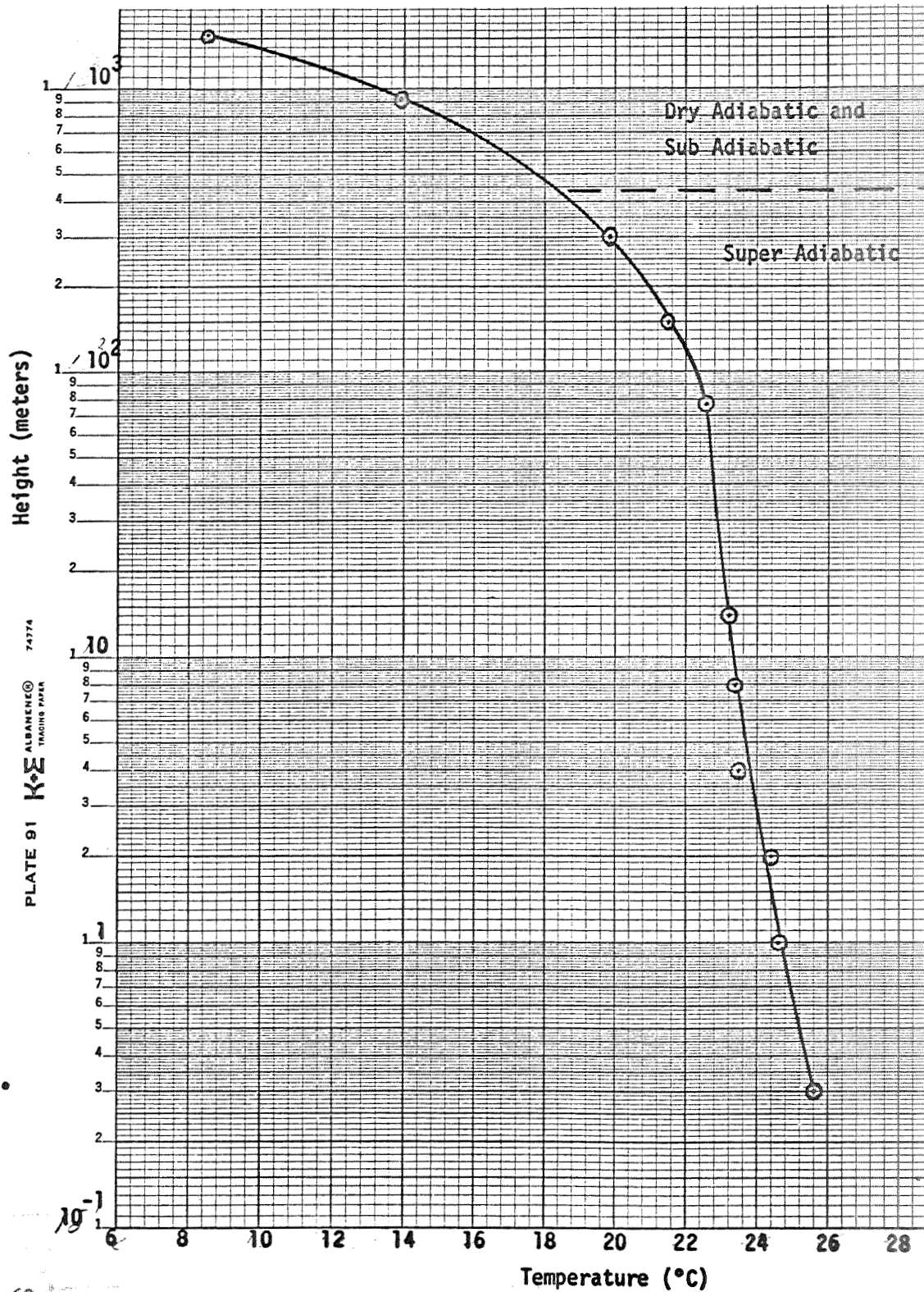
1345 PDT



8-22-68

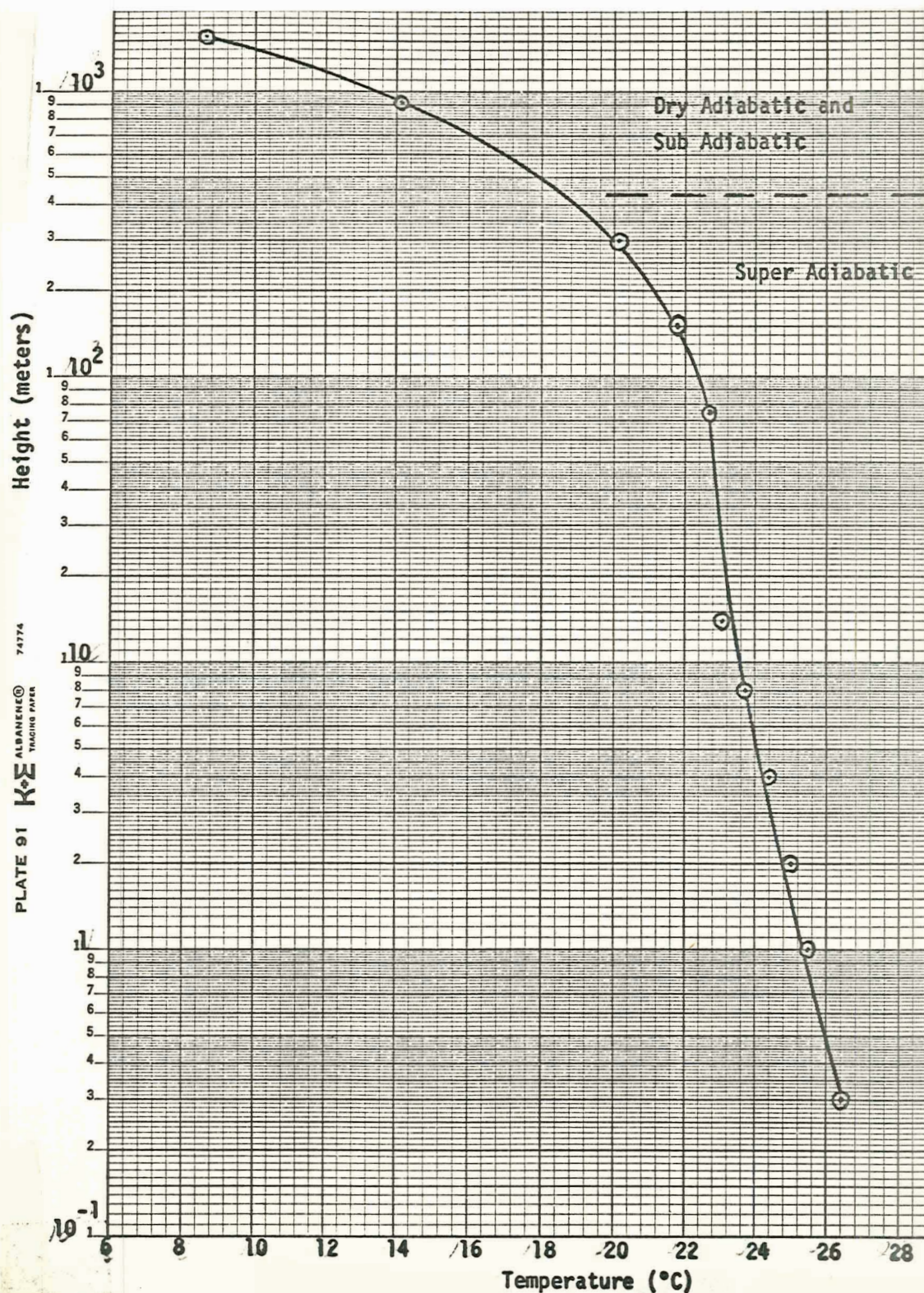
1405 PDT

M 30-692-6 (8-68)



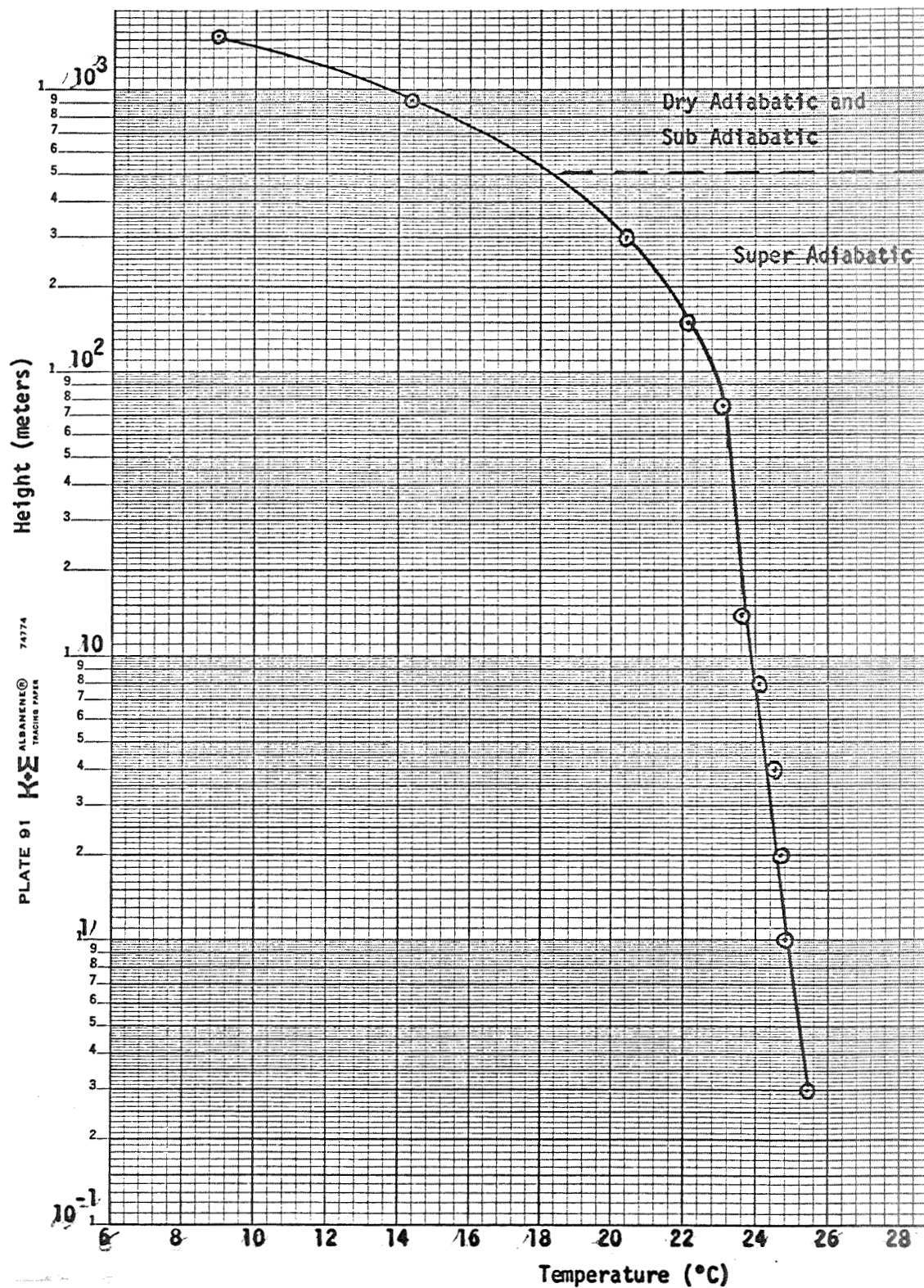
8-22-68

1415 PDT



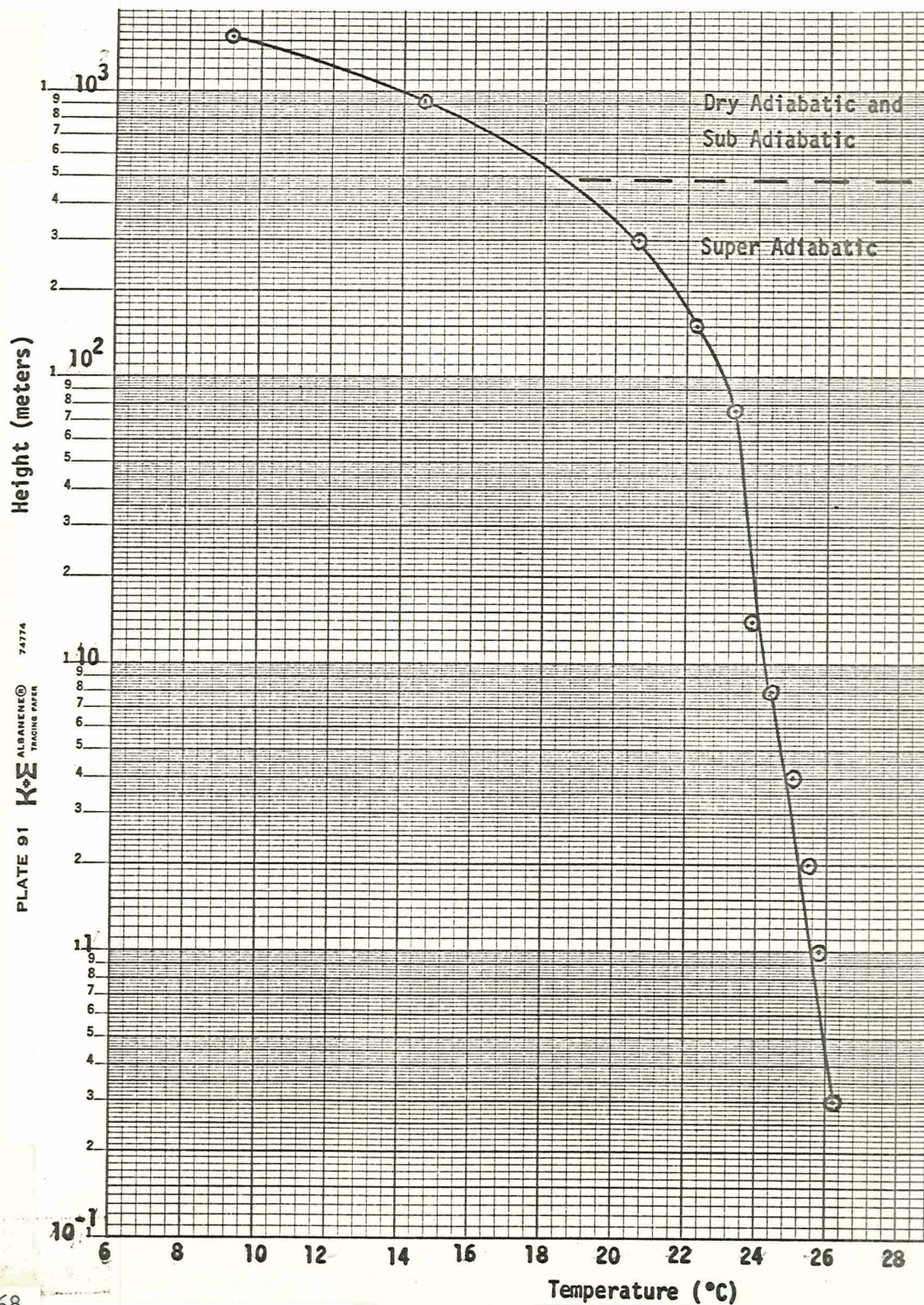
8-22-68

1435 PDT



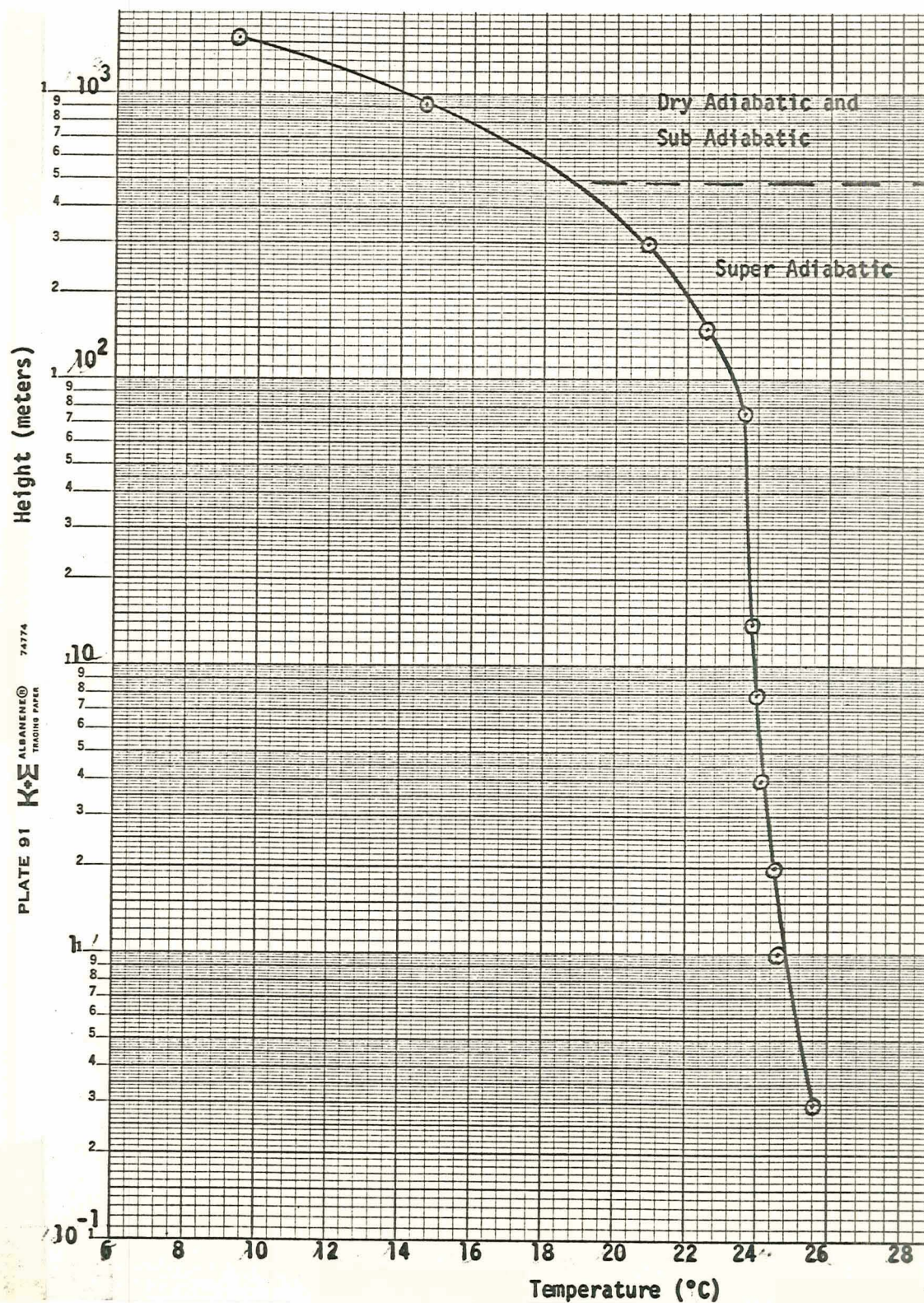
8-22-68

1455 PDT



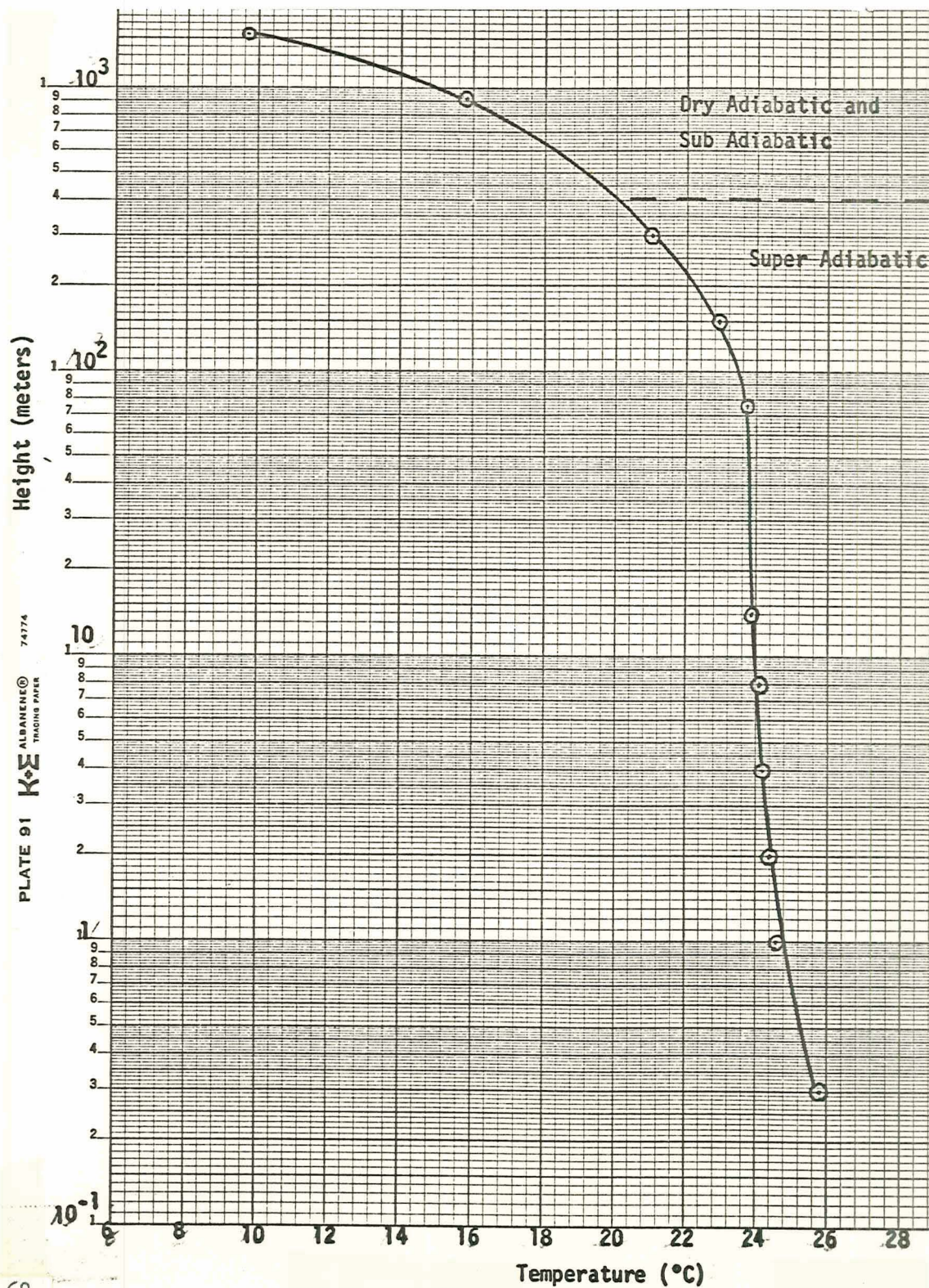
8-22-68

1515 PDT



8-22-68

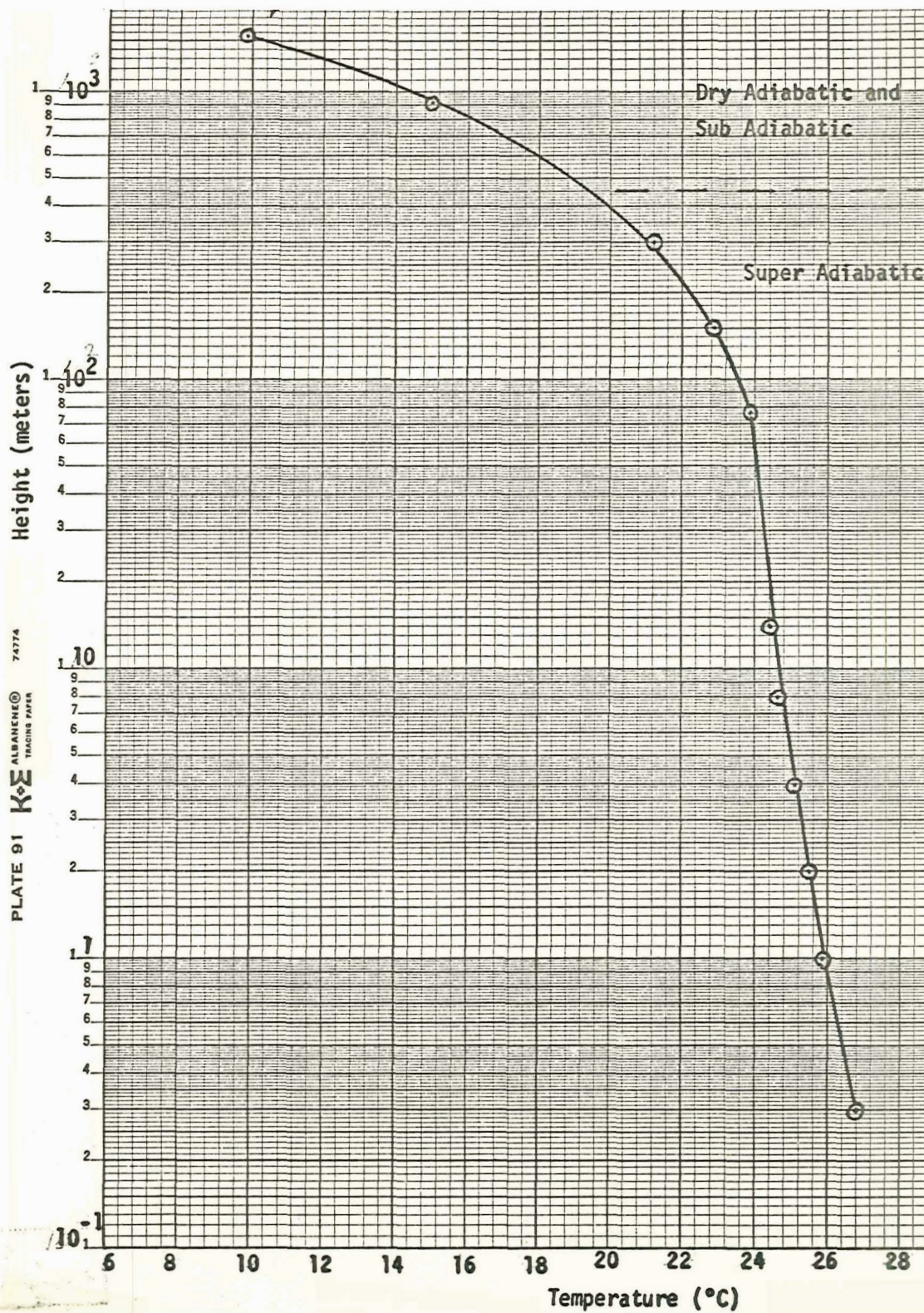
1530 PDT



8-22-68

1545 PDT

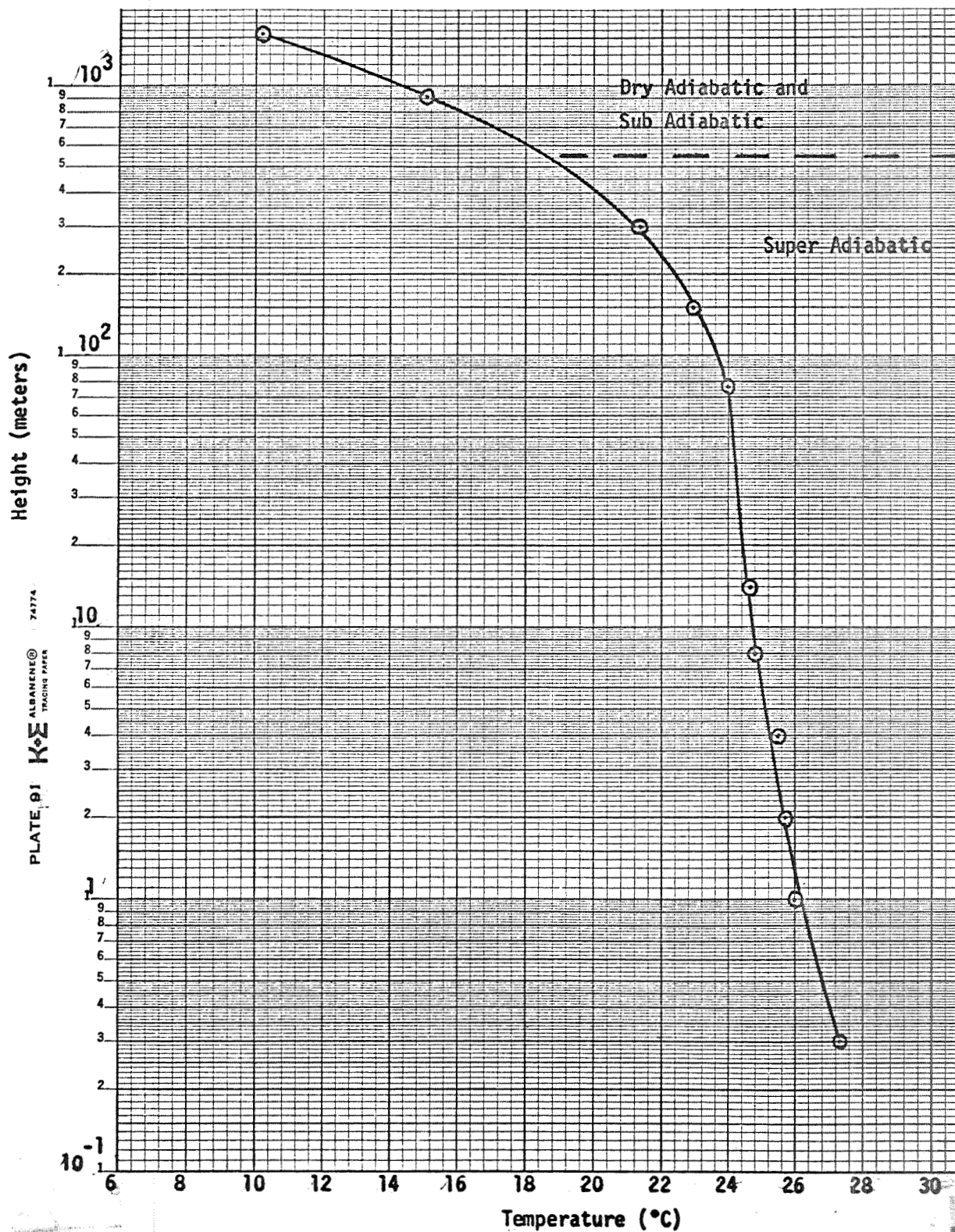
M 30-692-6 (8-68)



8-22-68

1600 PDT

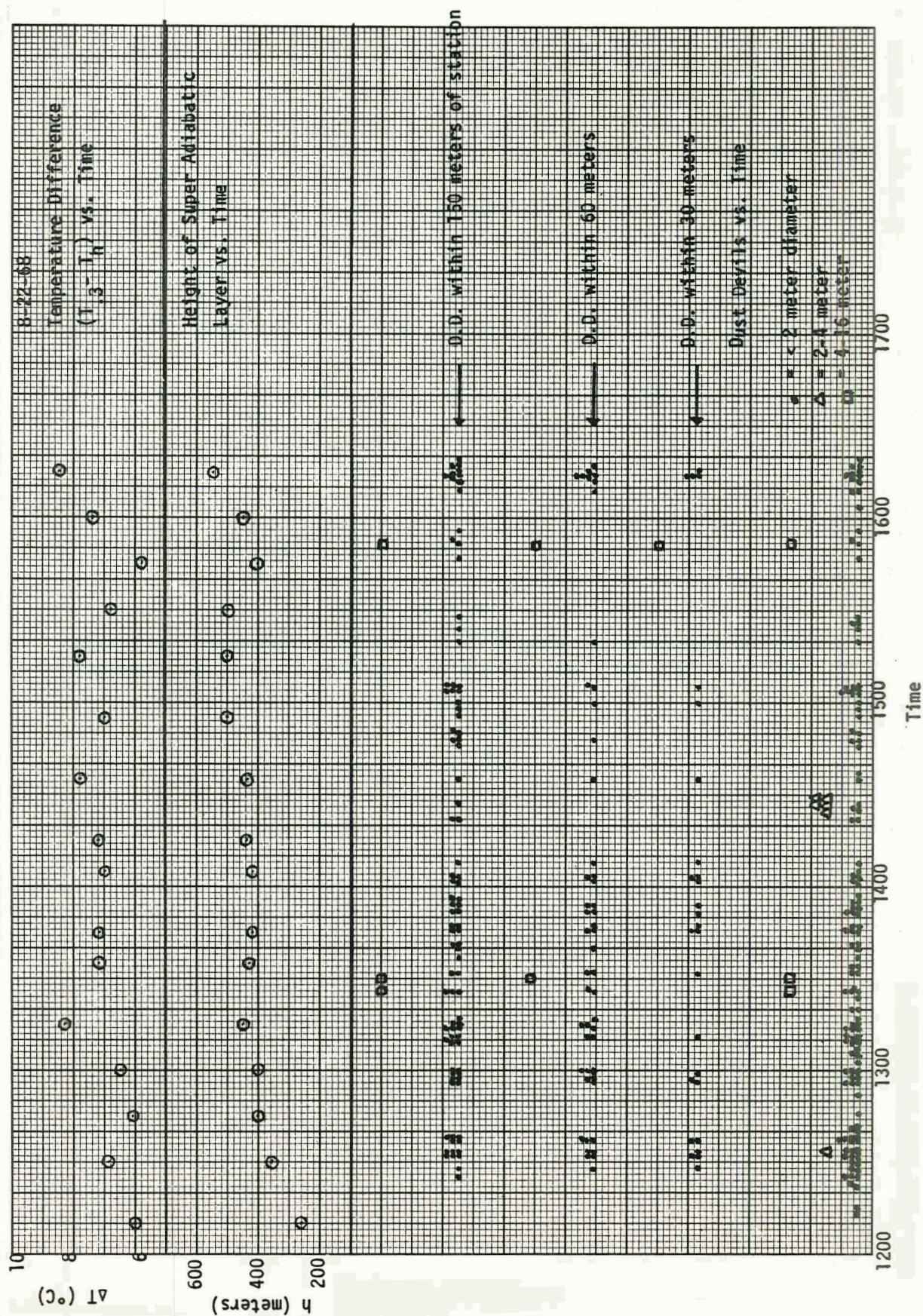
M 30-692-6 (8-68)

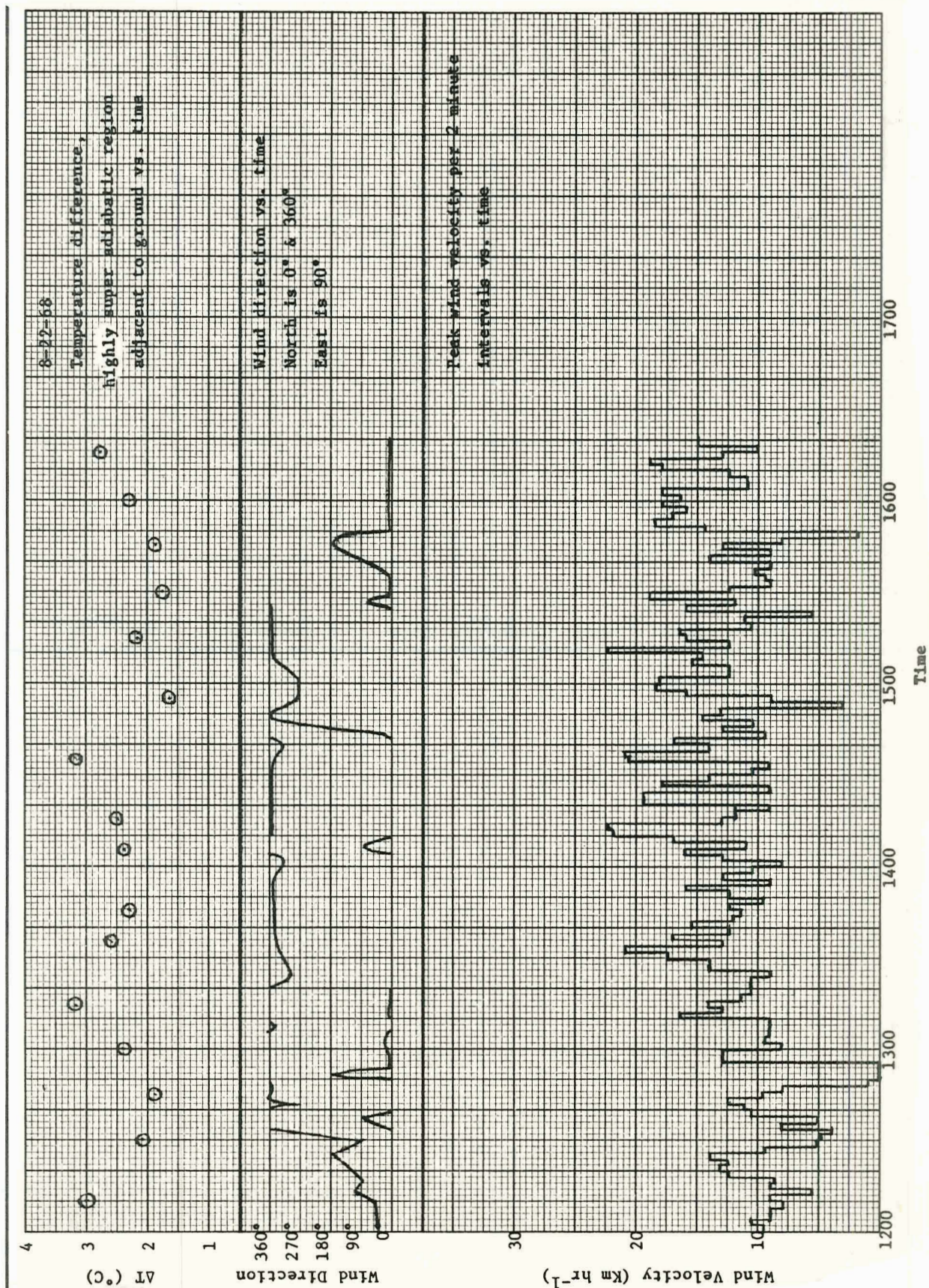


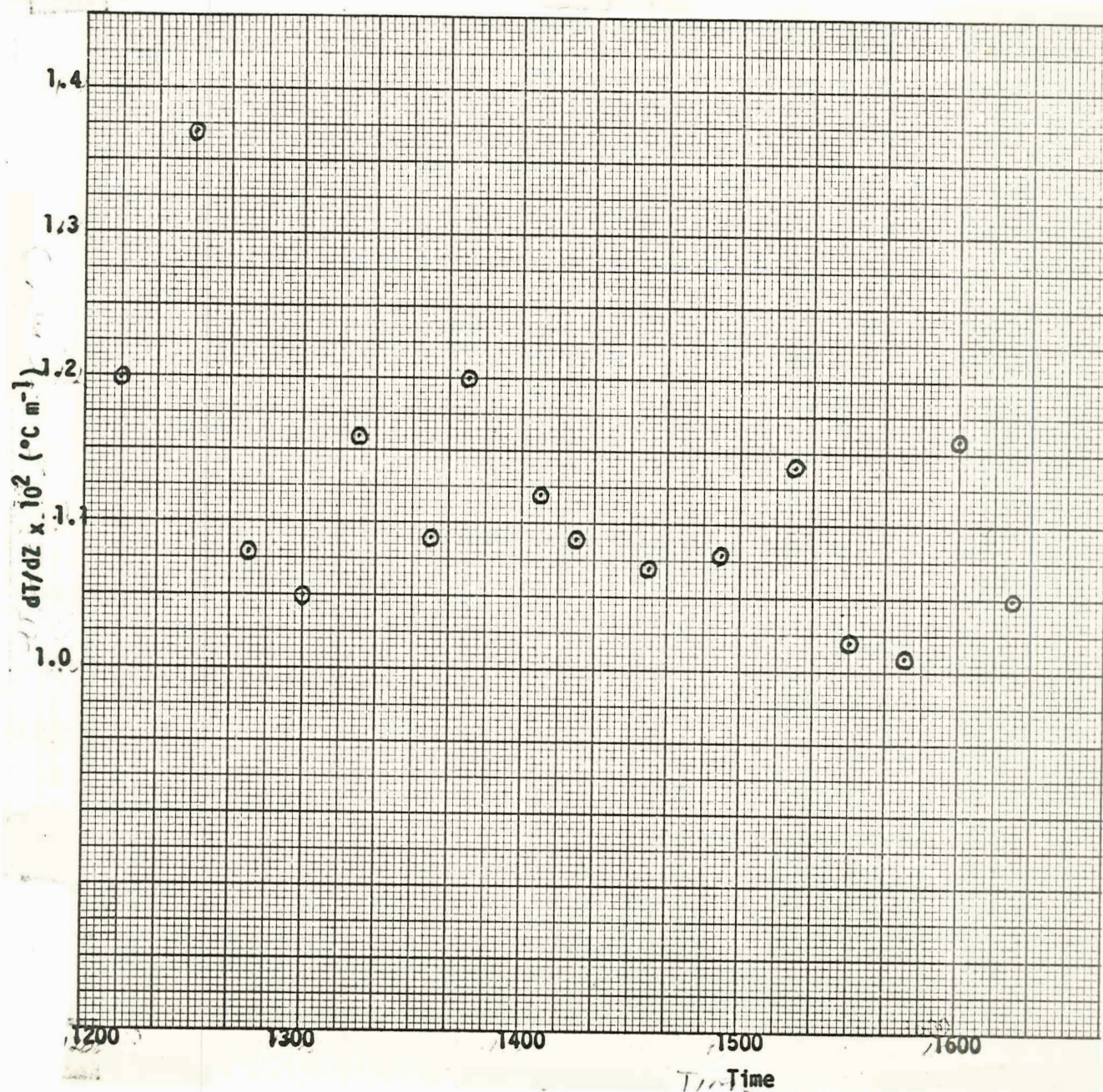
8-22-68

1615 PDT

130-692-9 (8-68)

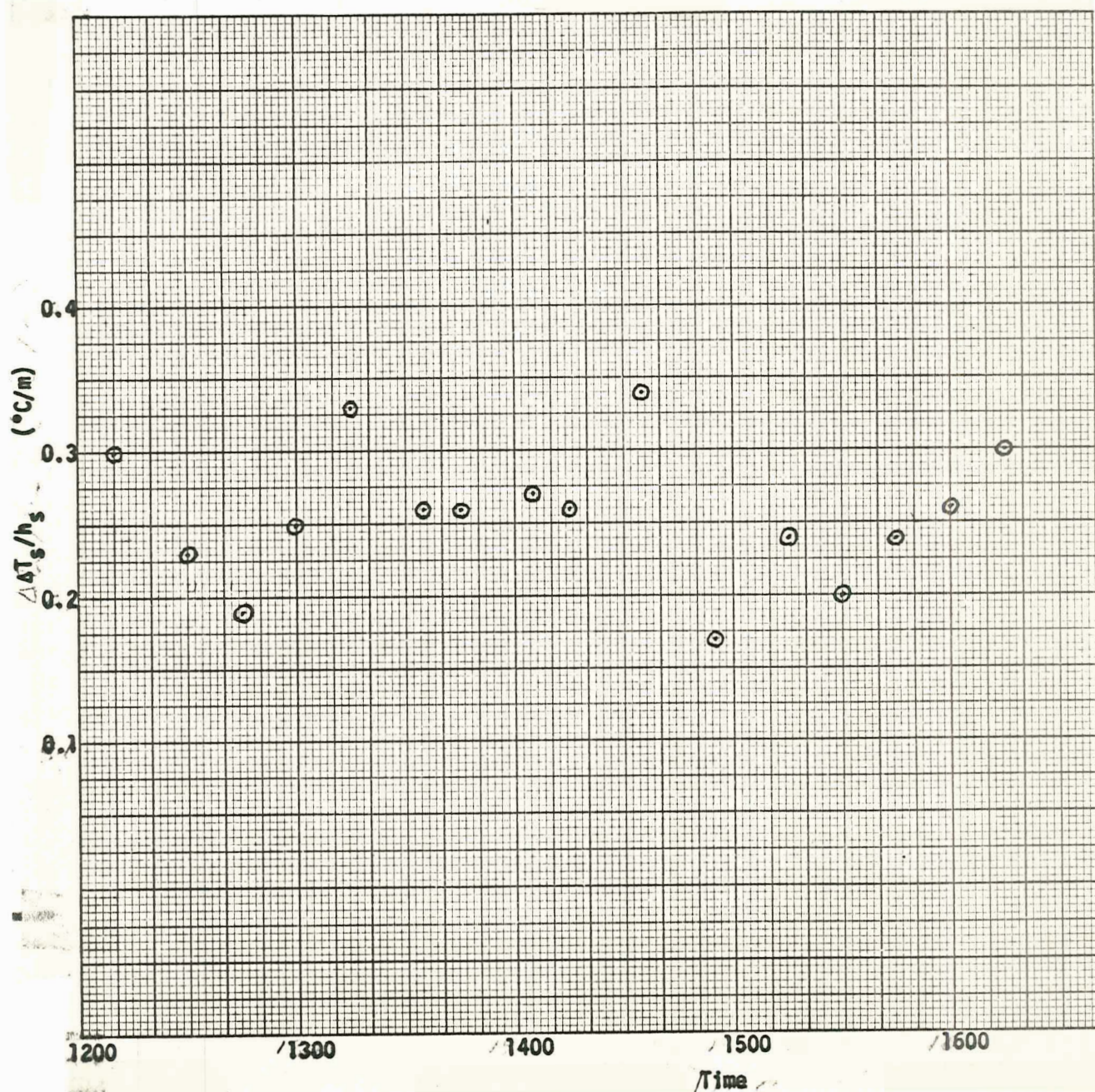






8-22-68

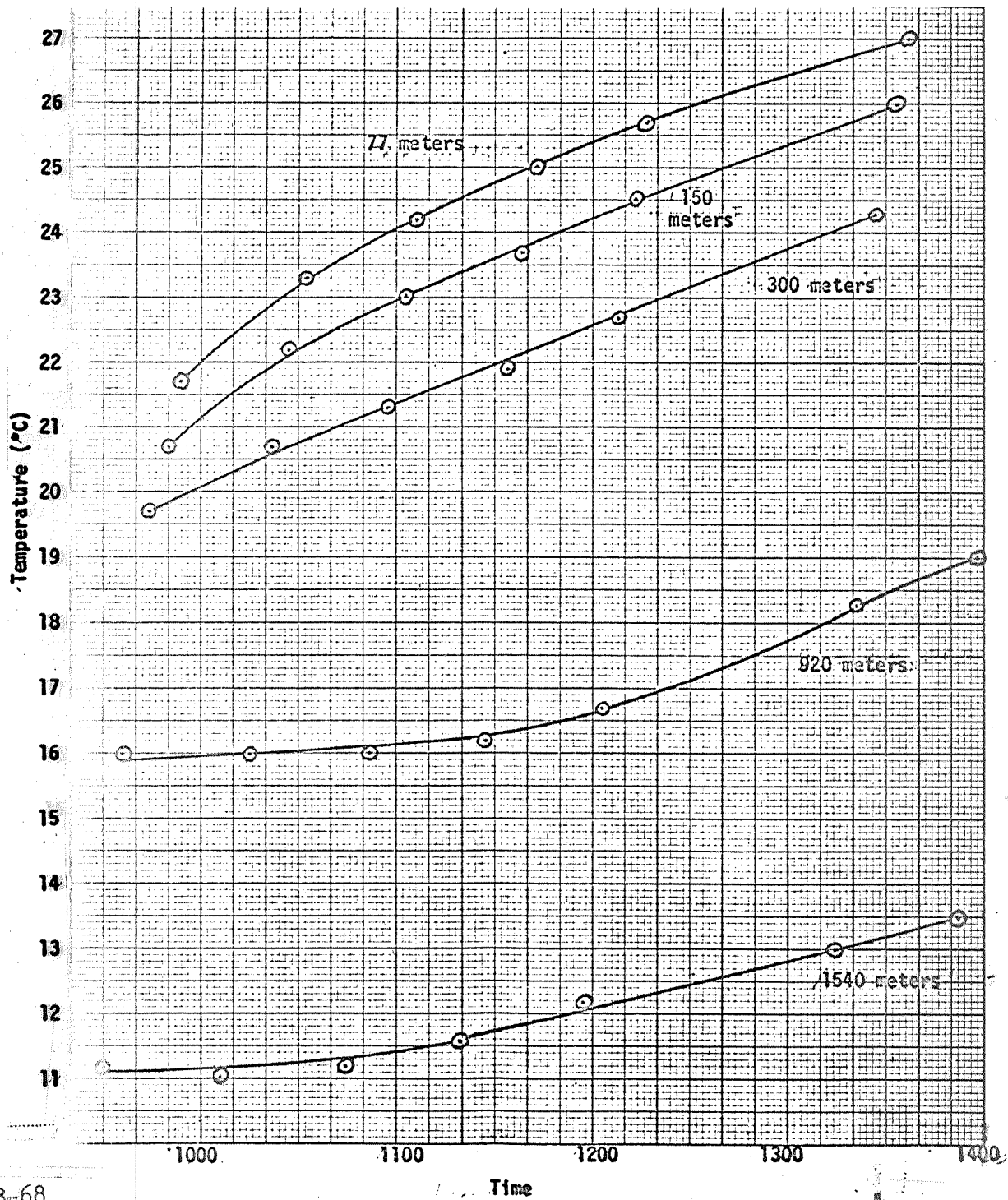
Lapse Rate ($\frac{dT}{dZ}$) vs. Time



8-22-68

$\frac{\Delta T_s}{h_s}$ vs. Time

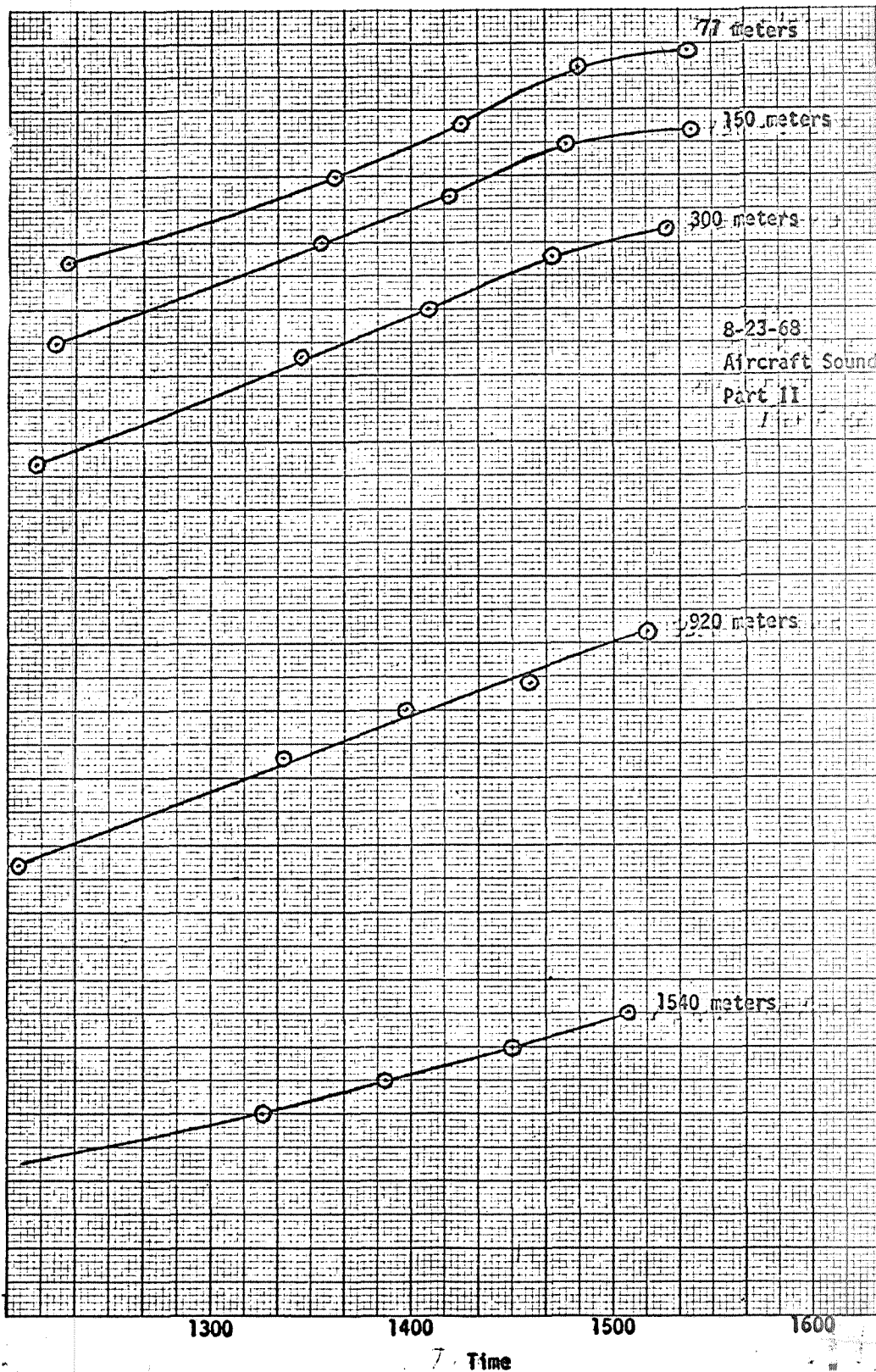
DATA FOR 8-23-68



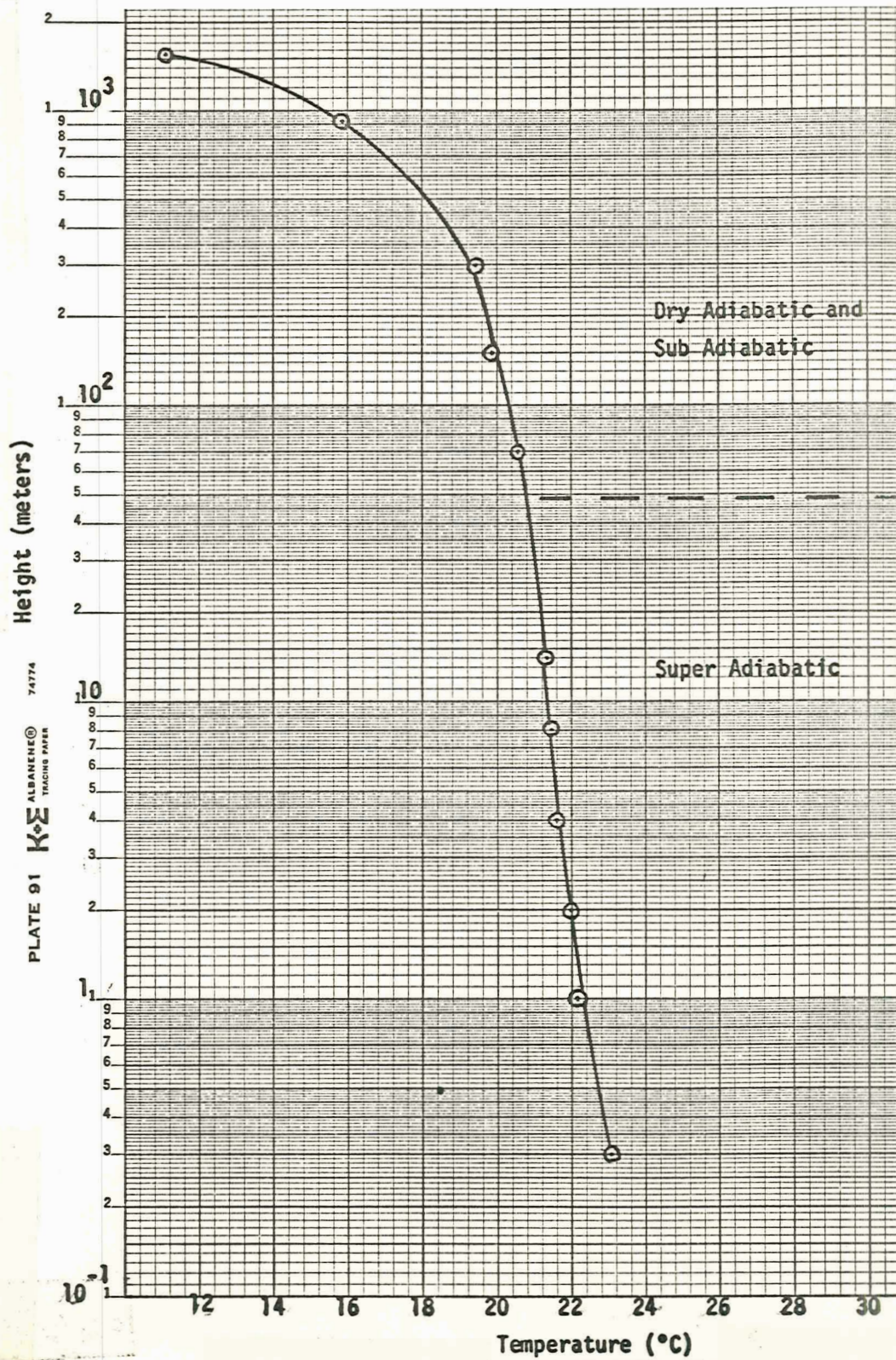
8-23-68

Aircraft Soundings

Part I

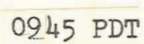


8-23-68
Aircraft Soundings
Part II



8-23-68

0930 PDT



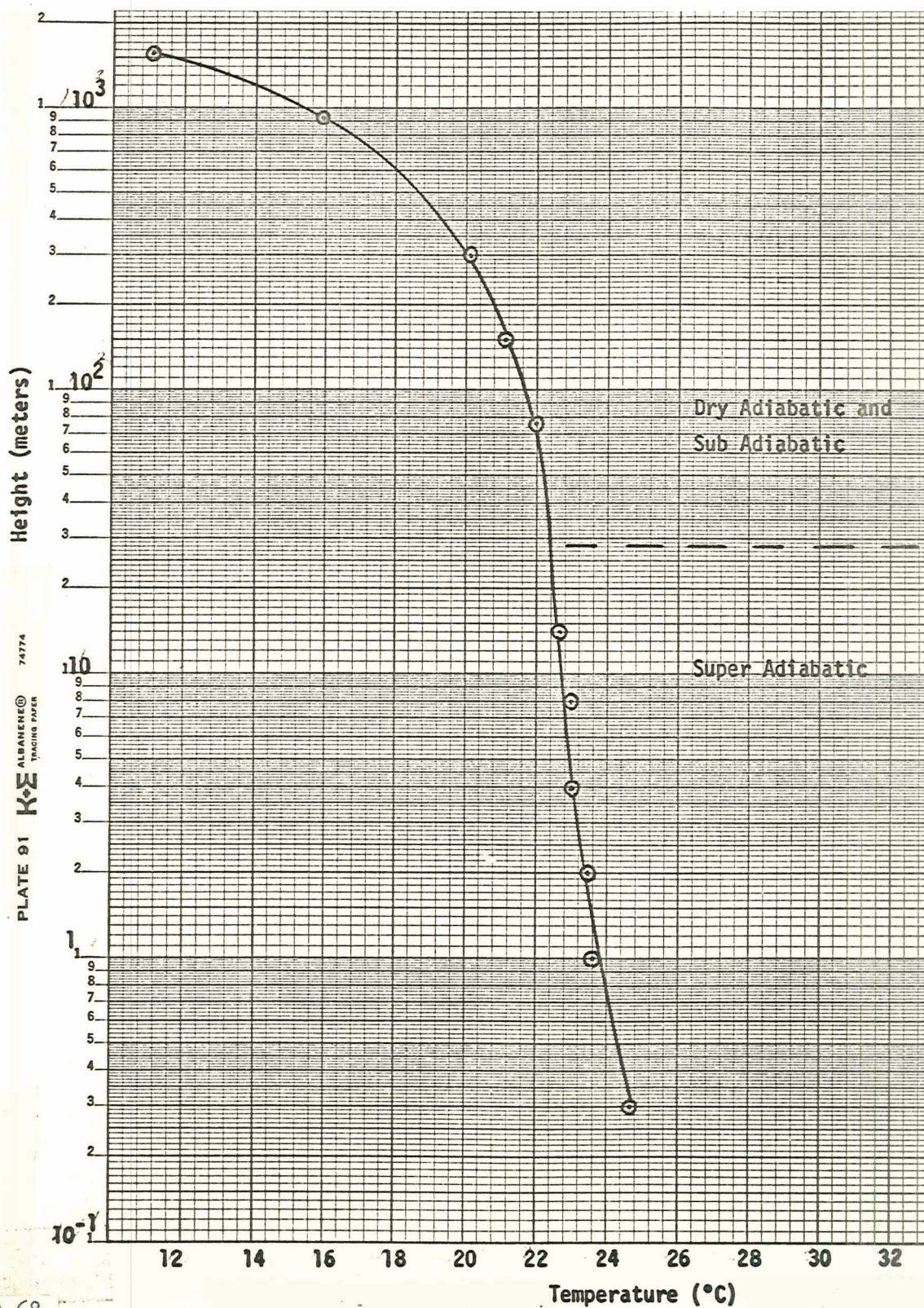
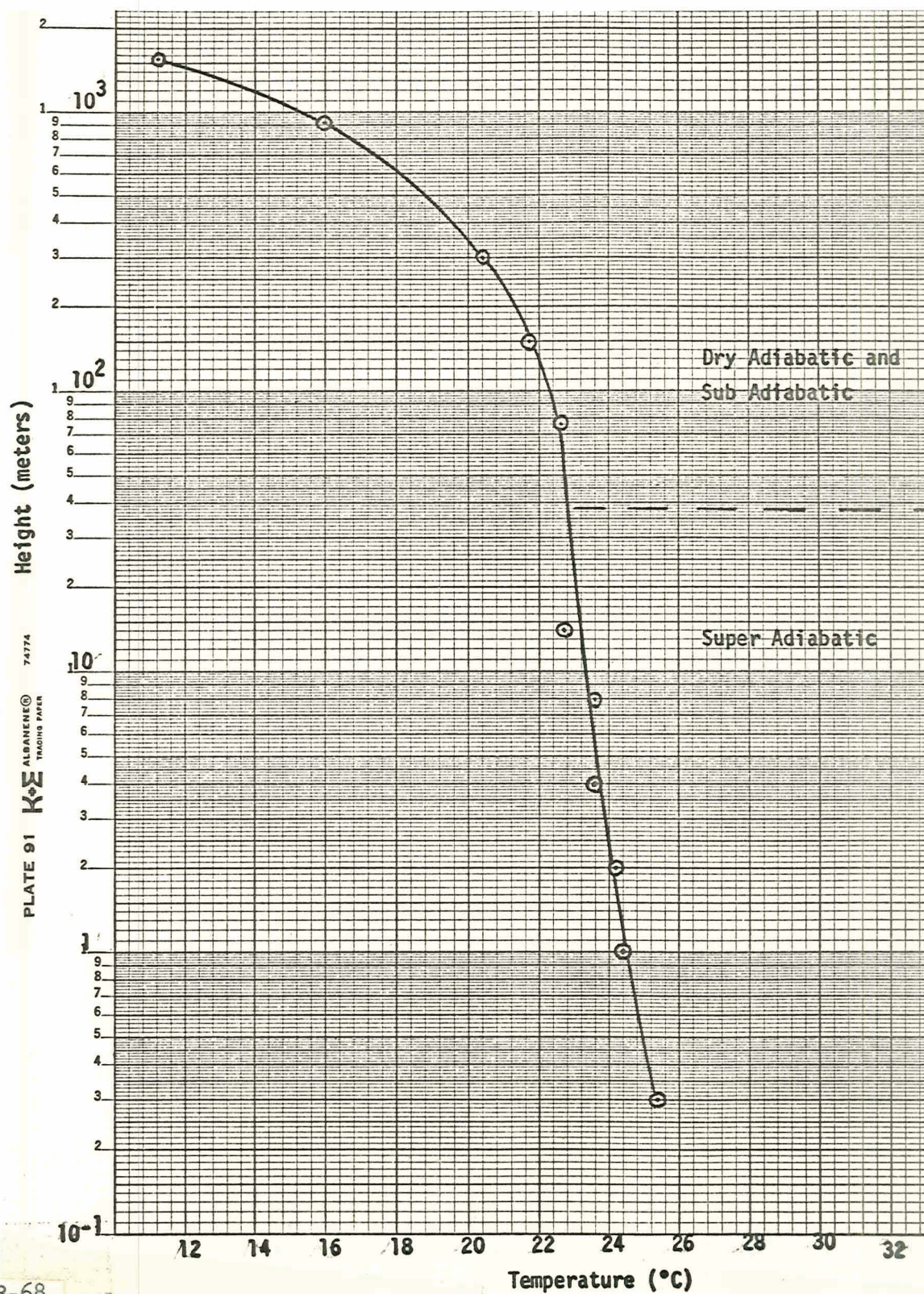


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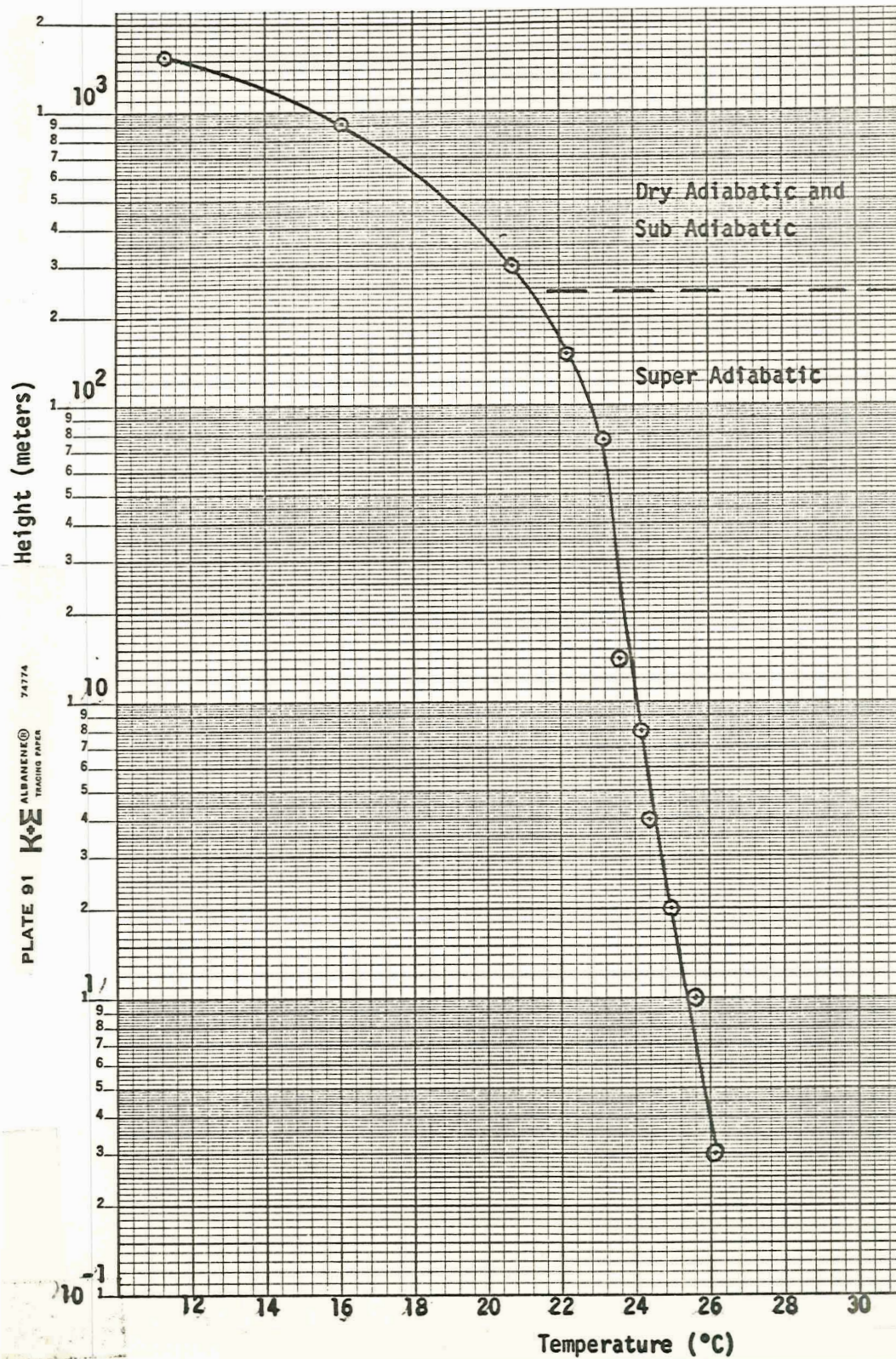
8-23-68

1000 PDT



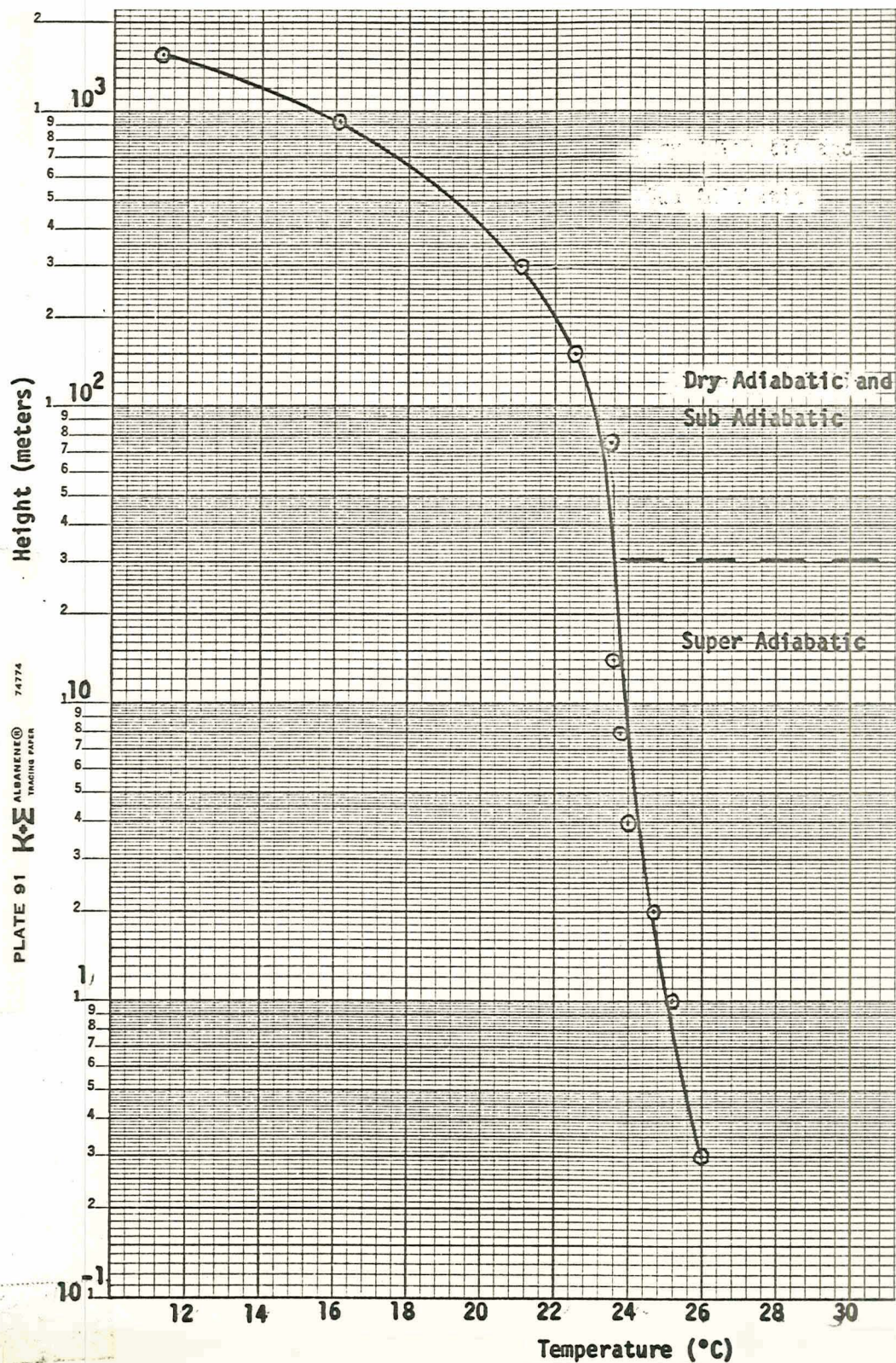
8-23-68

1015 PDT



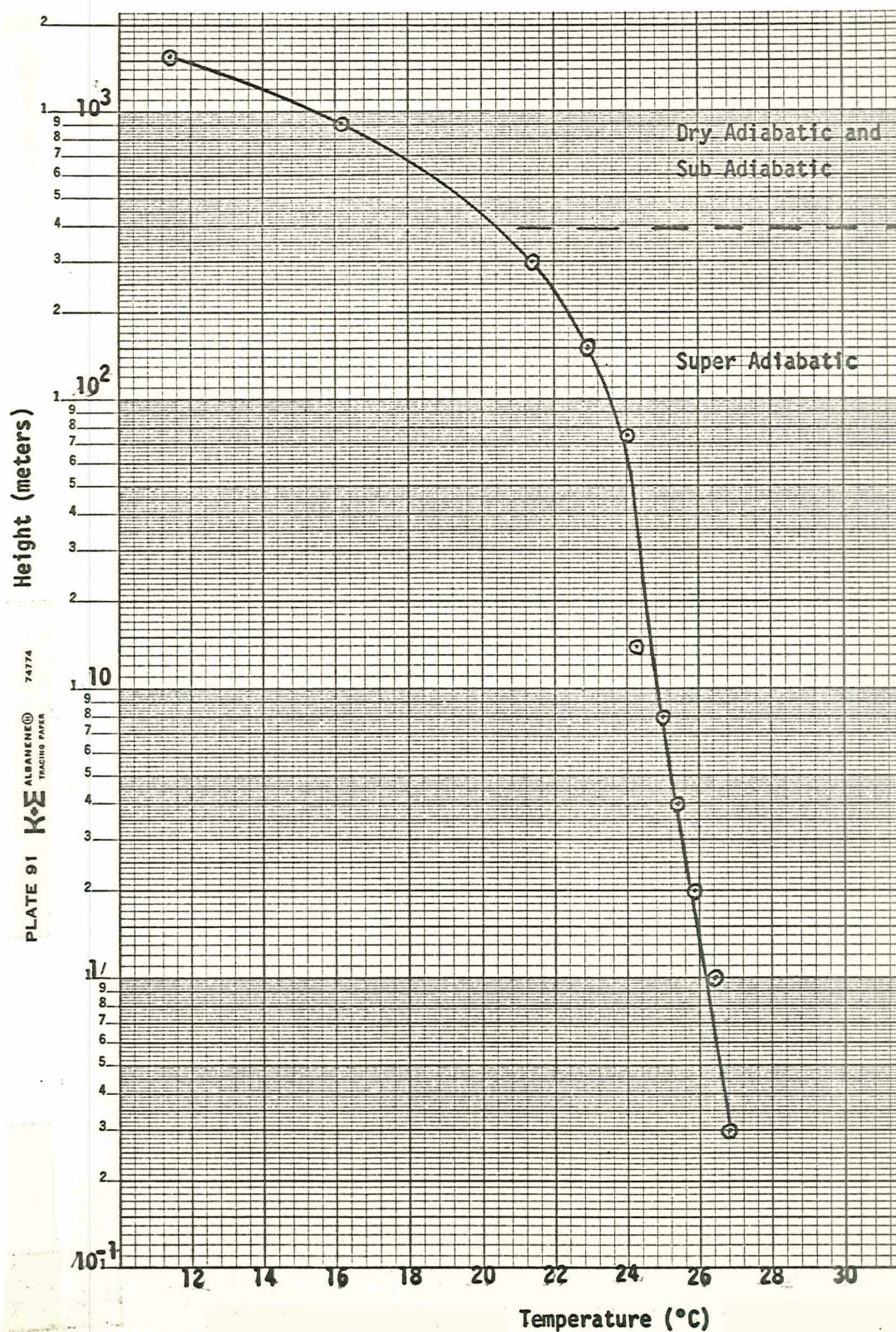
8-23-68

1030 PDT



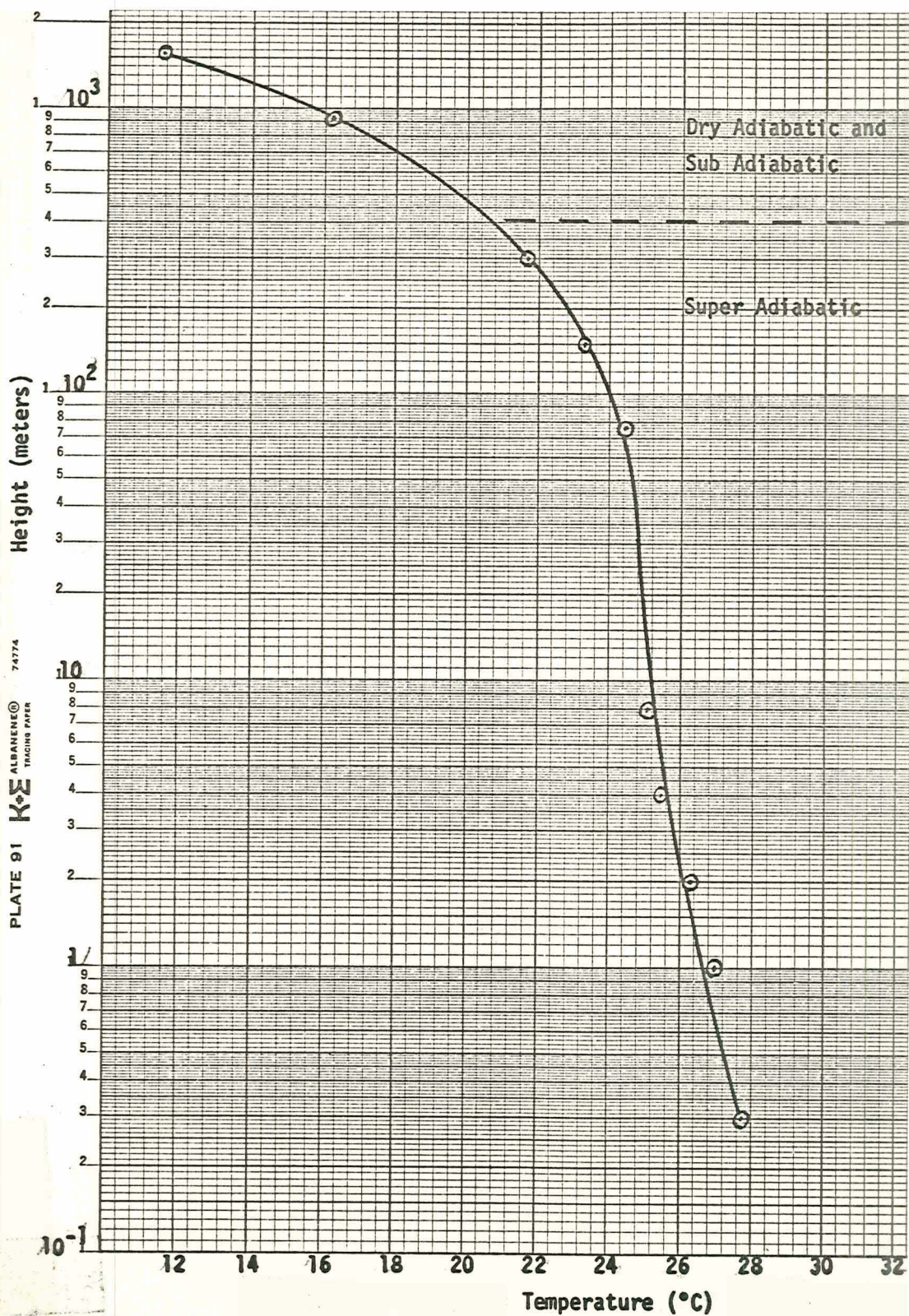
8-23-68

1045 PDT



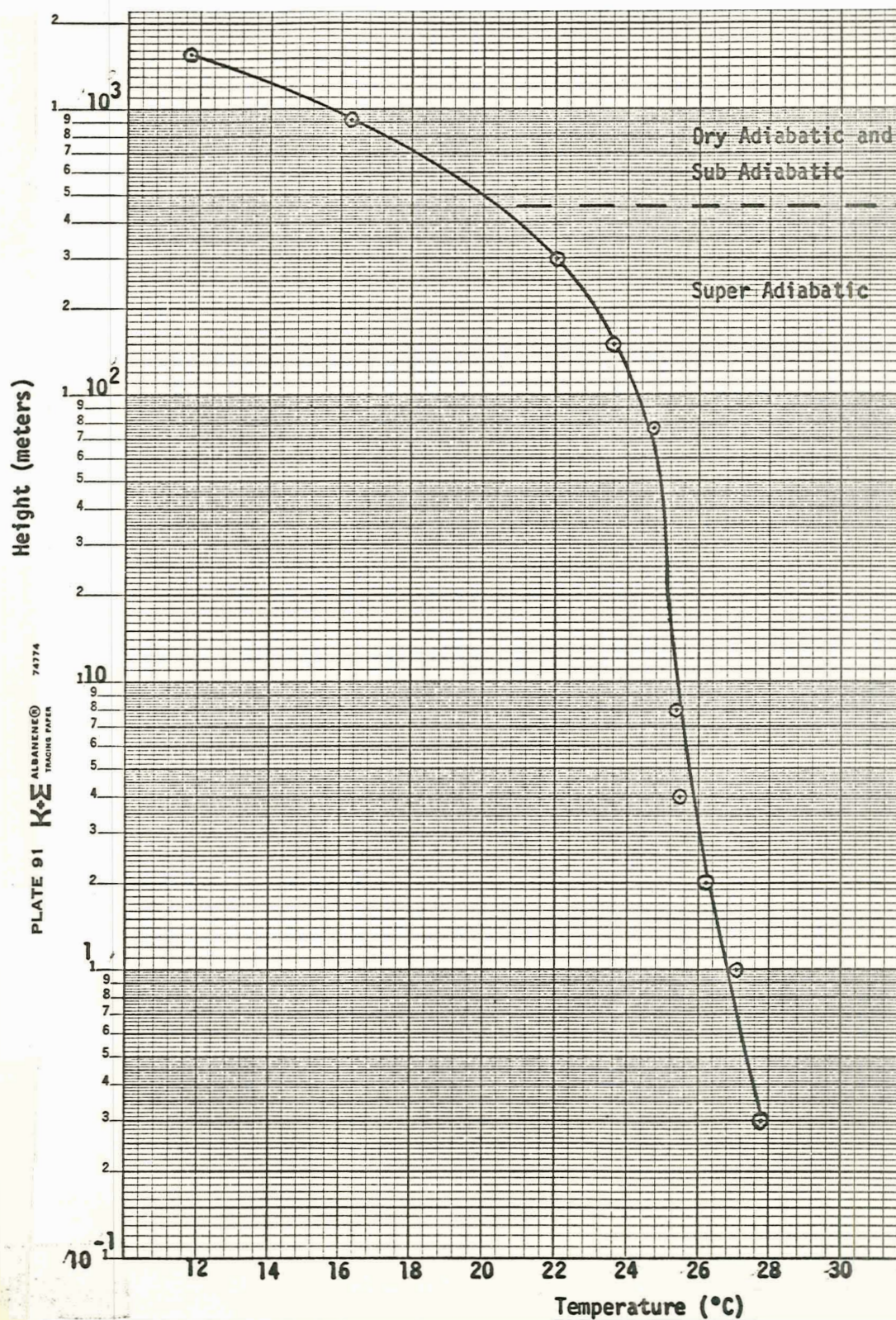
8-23-68

1100 PDT



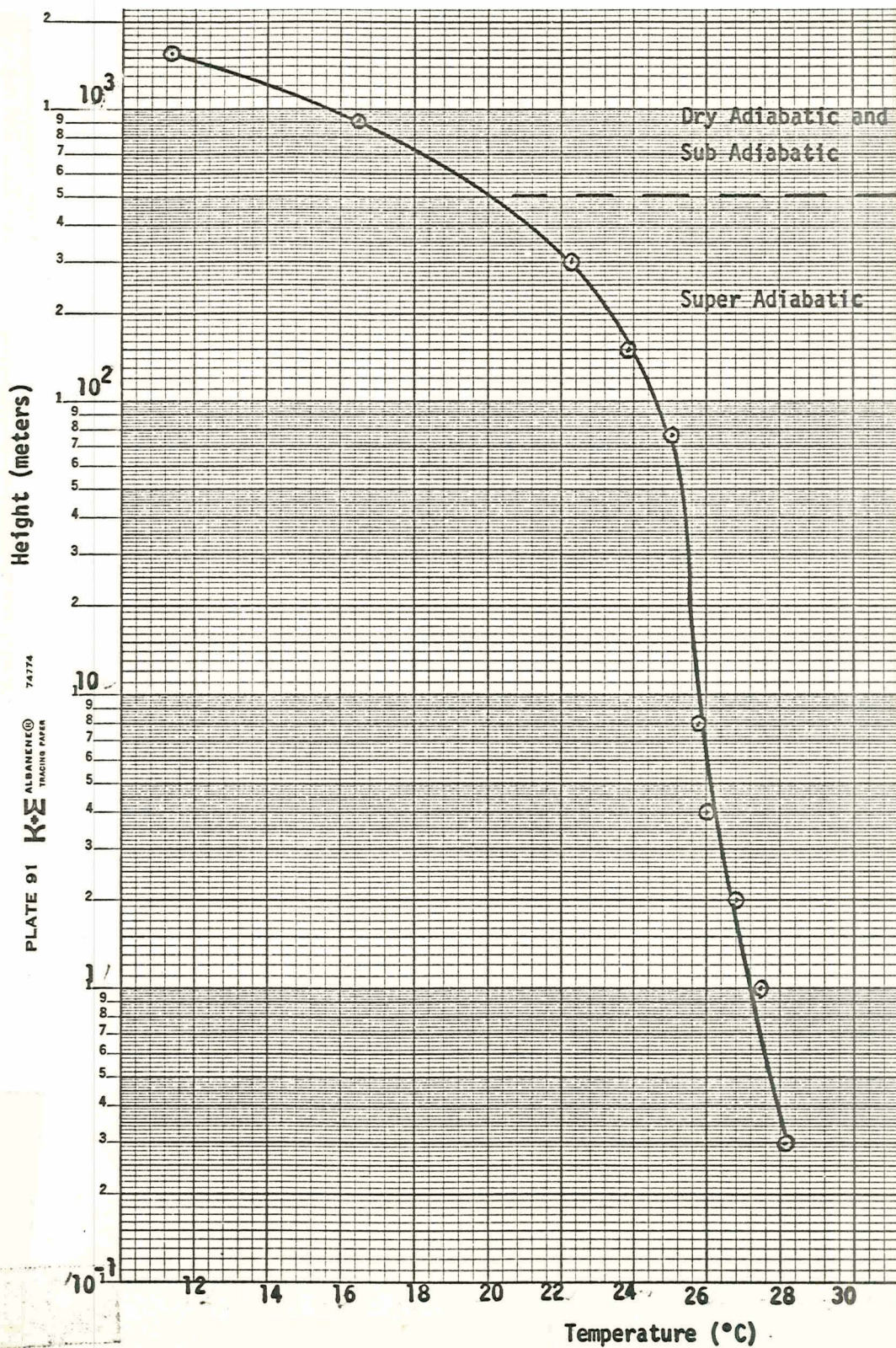
8-23-68

1117 PDT



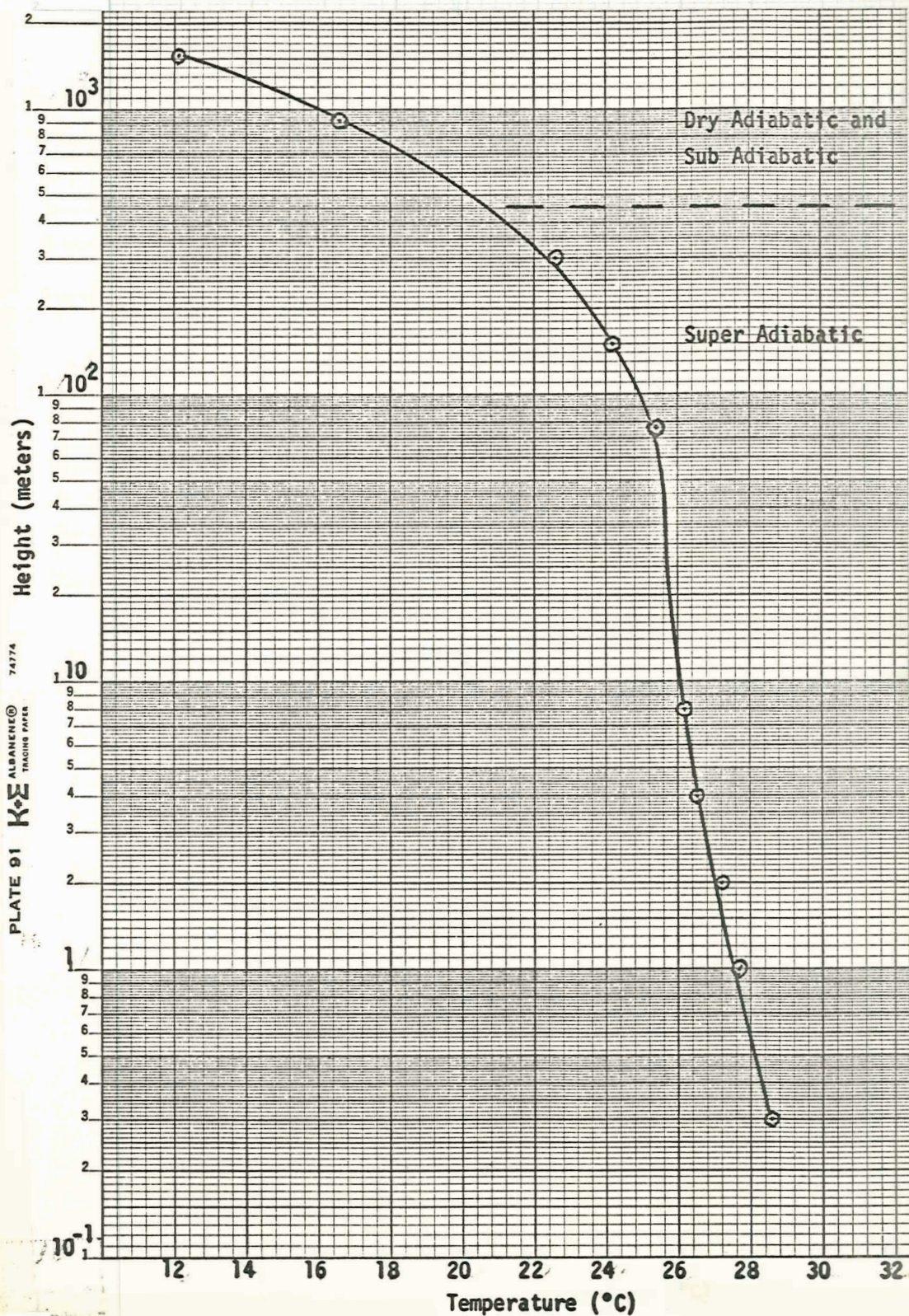
8-23-68

1130 PDT



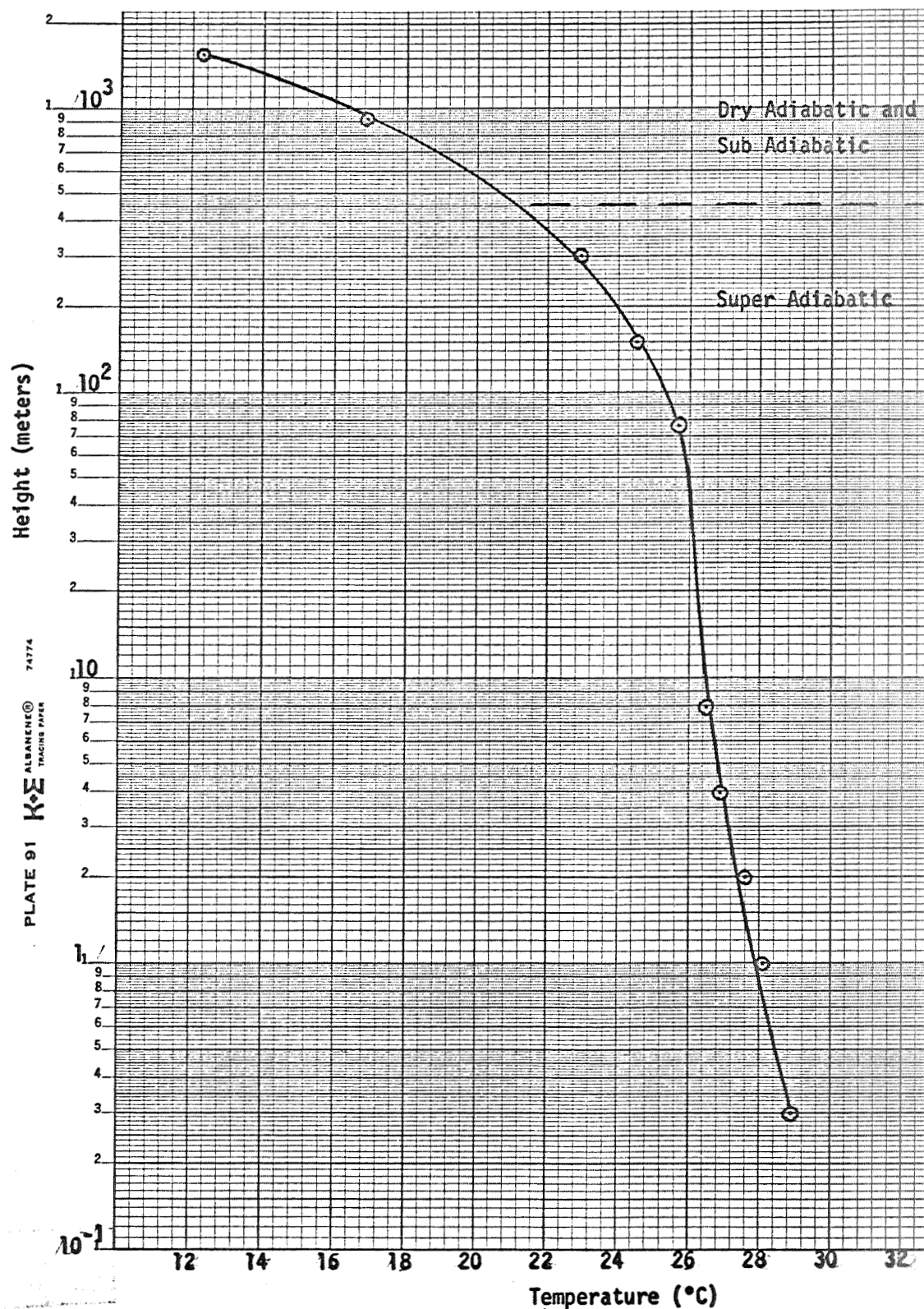
8-23-68

1145 PDT



8-23-68

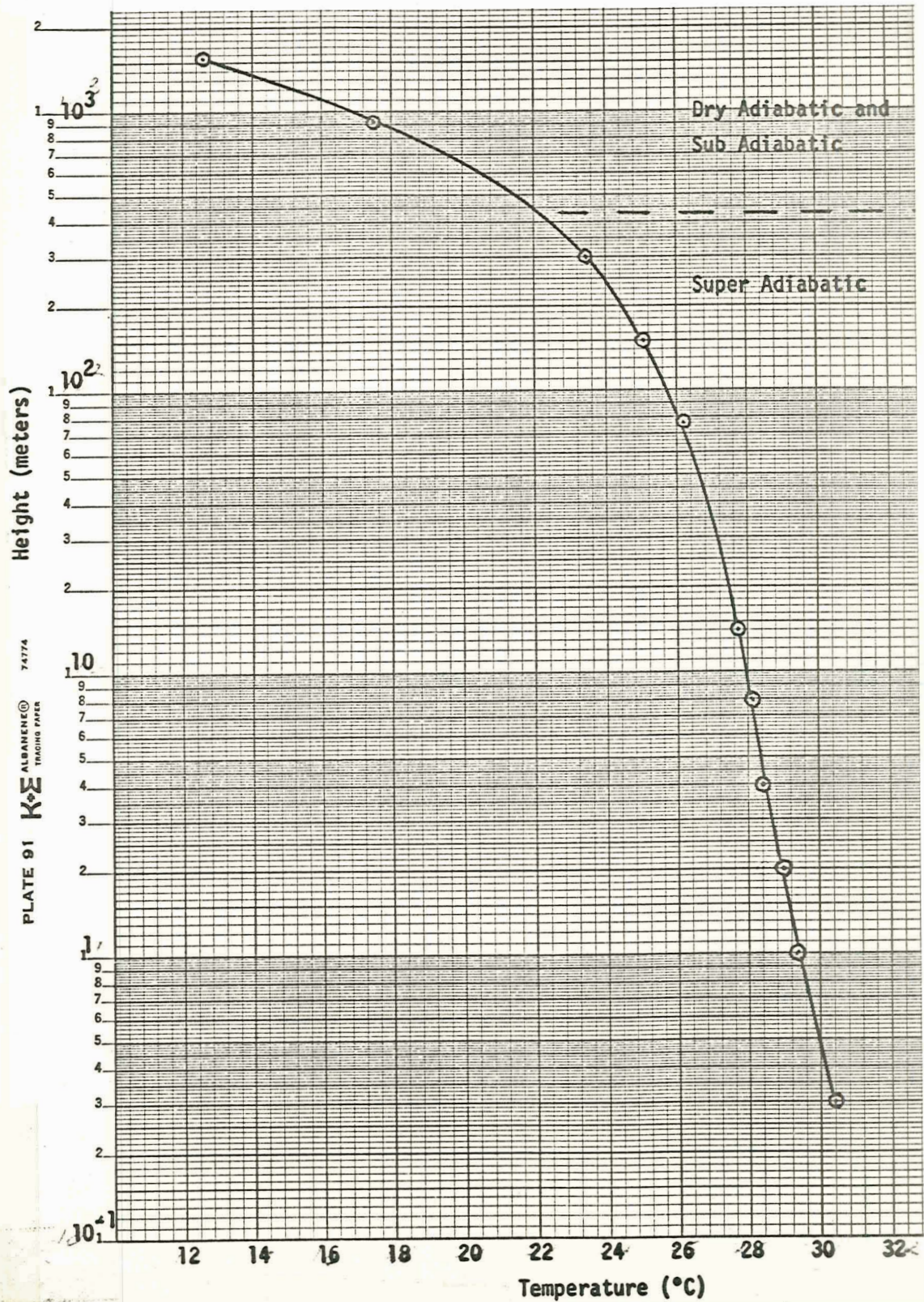
1200 PDT



8-23-68

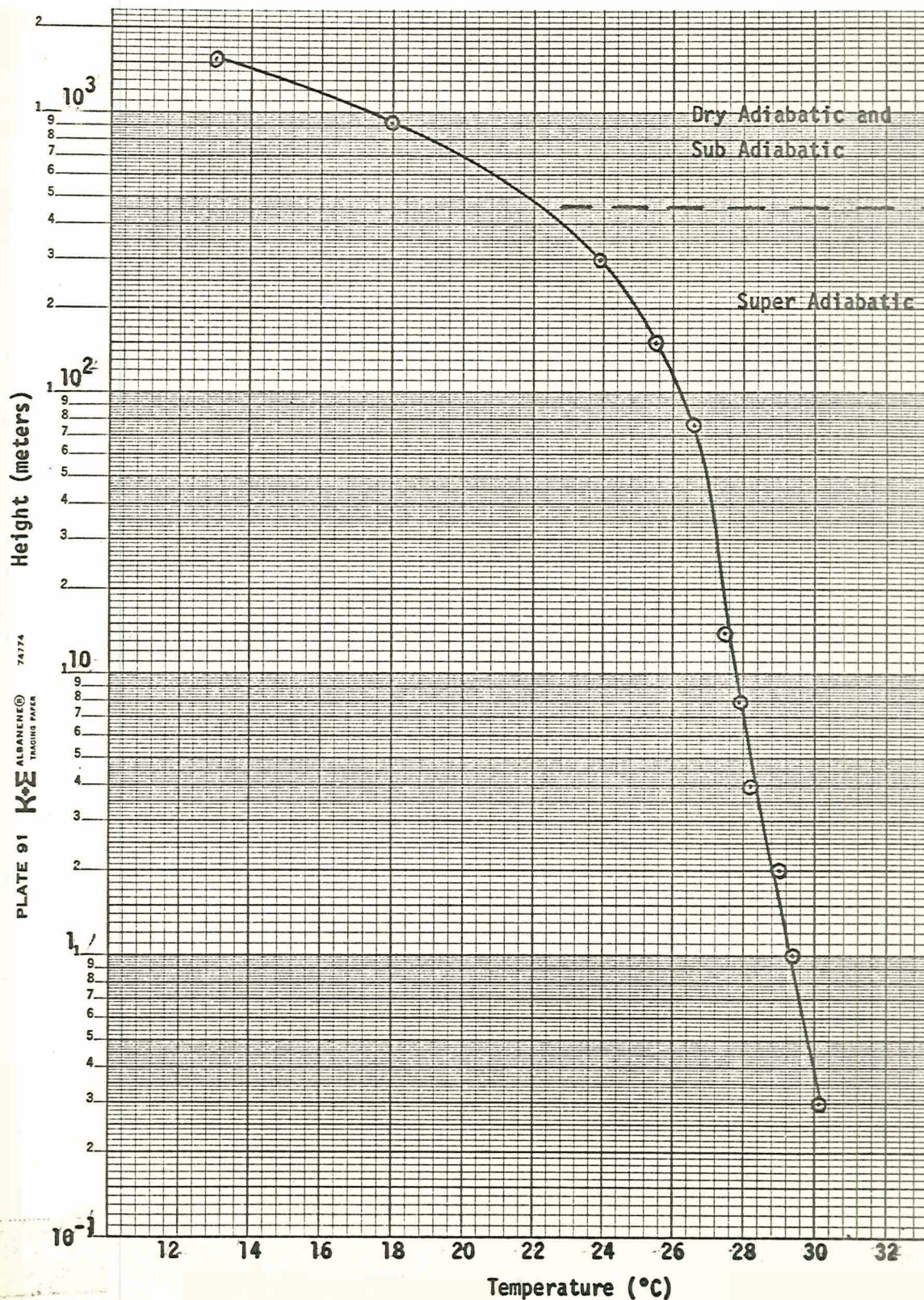
1215 PDT

M 30-692-6 (8-68)



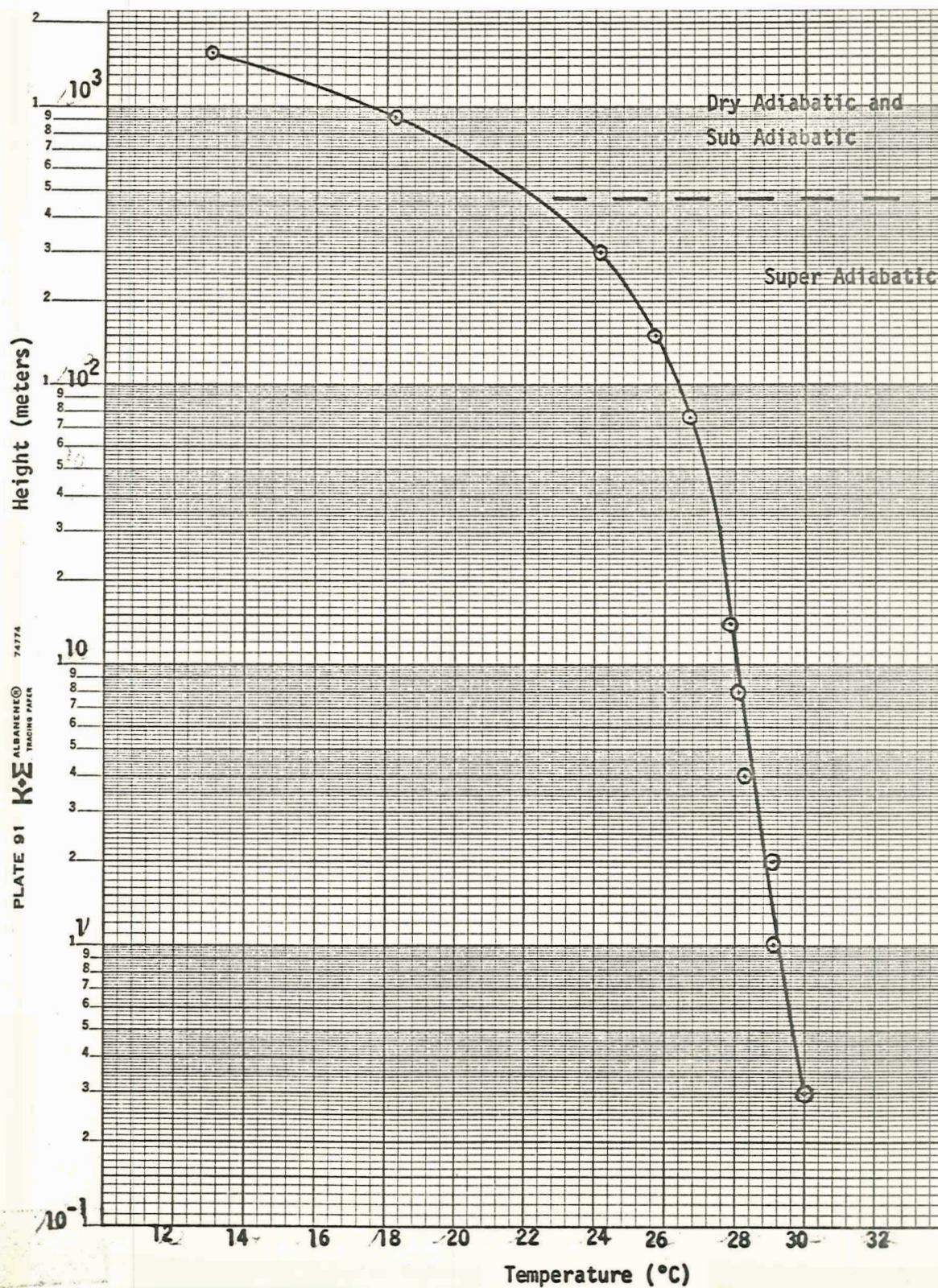
8-23-68

1245 PDT



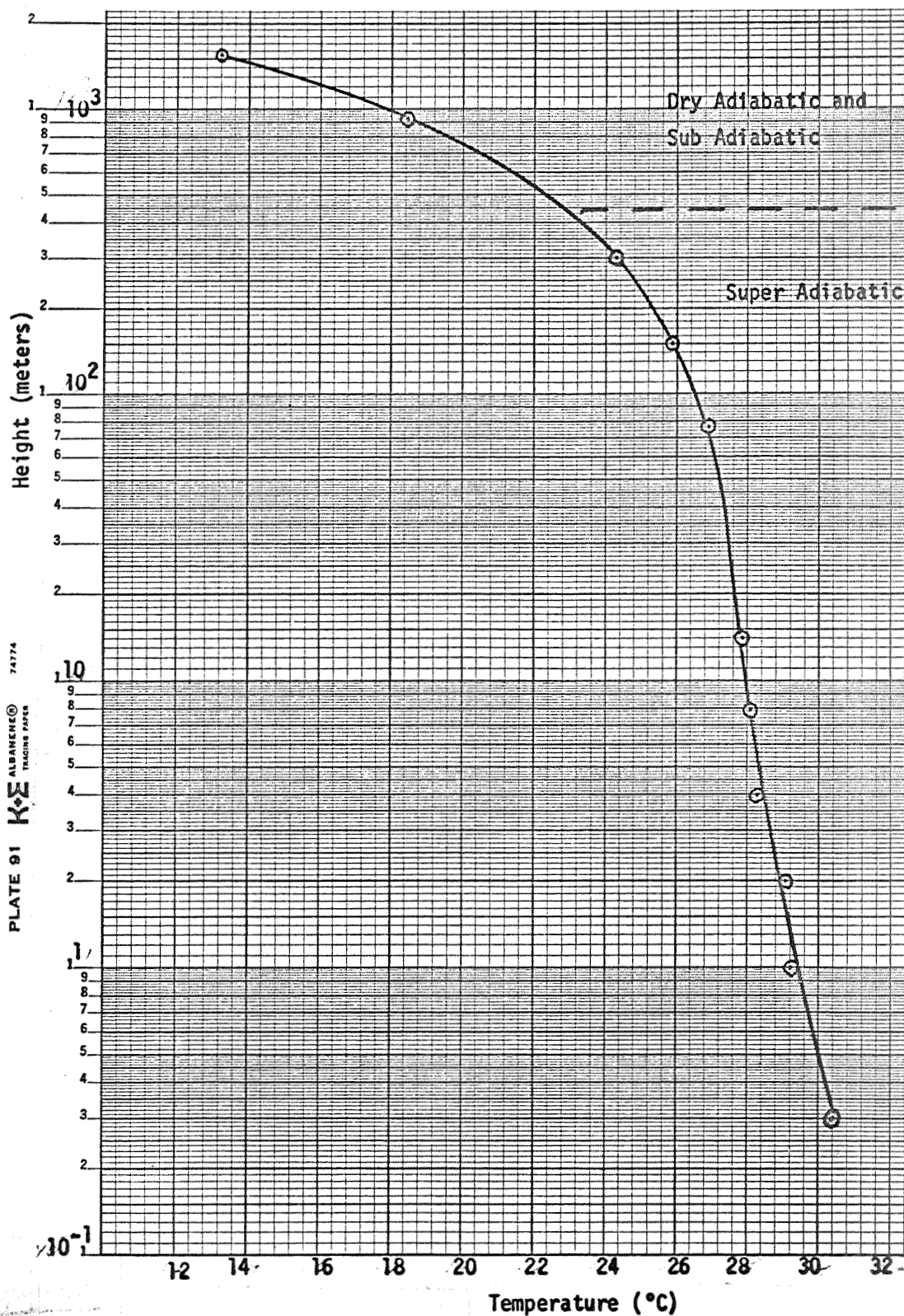
8-23-68

1310 PDT



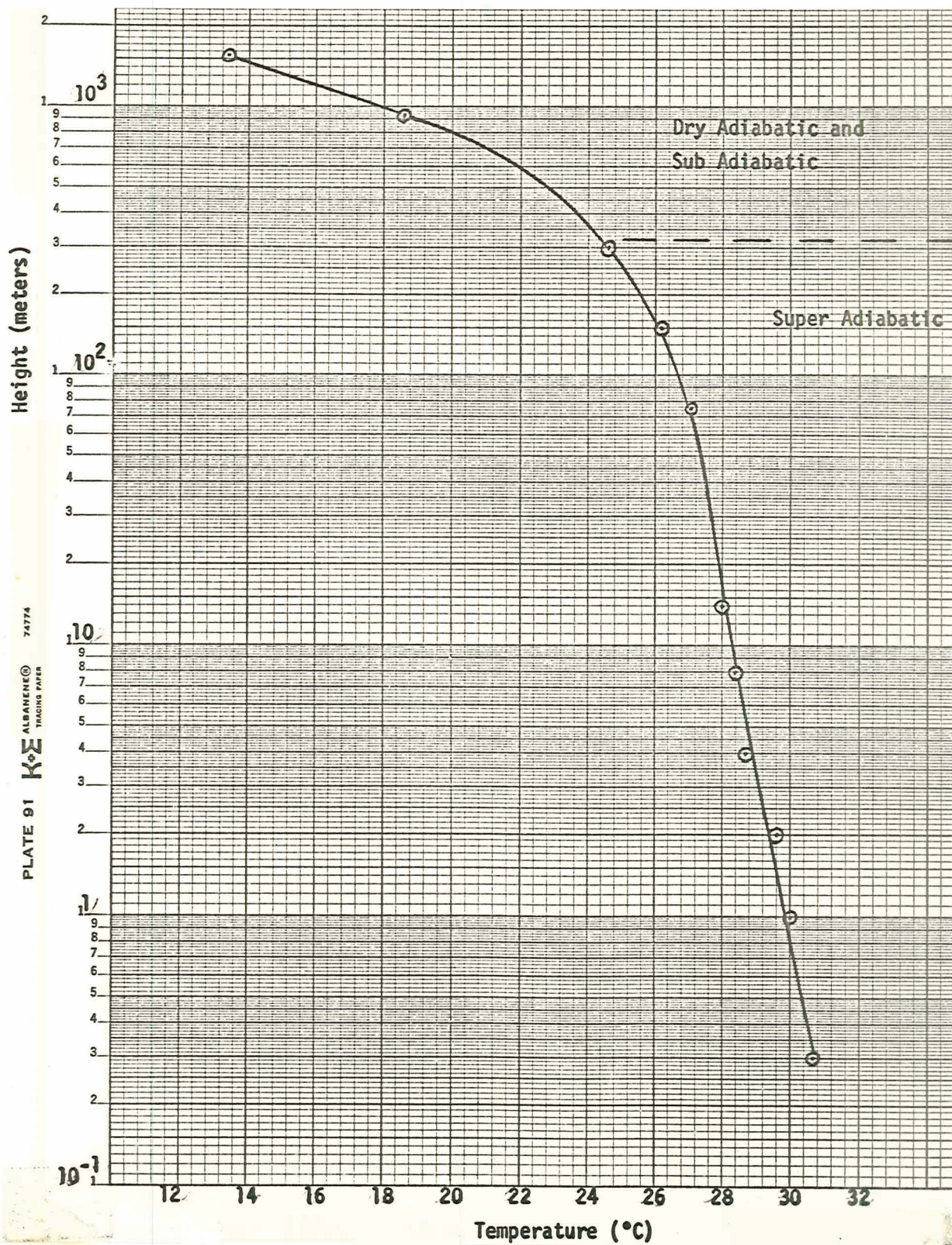
8-23-68

1320 PDT



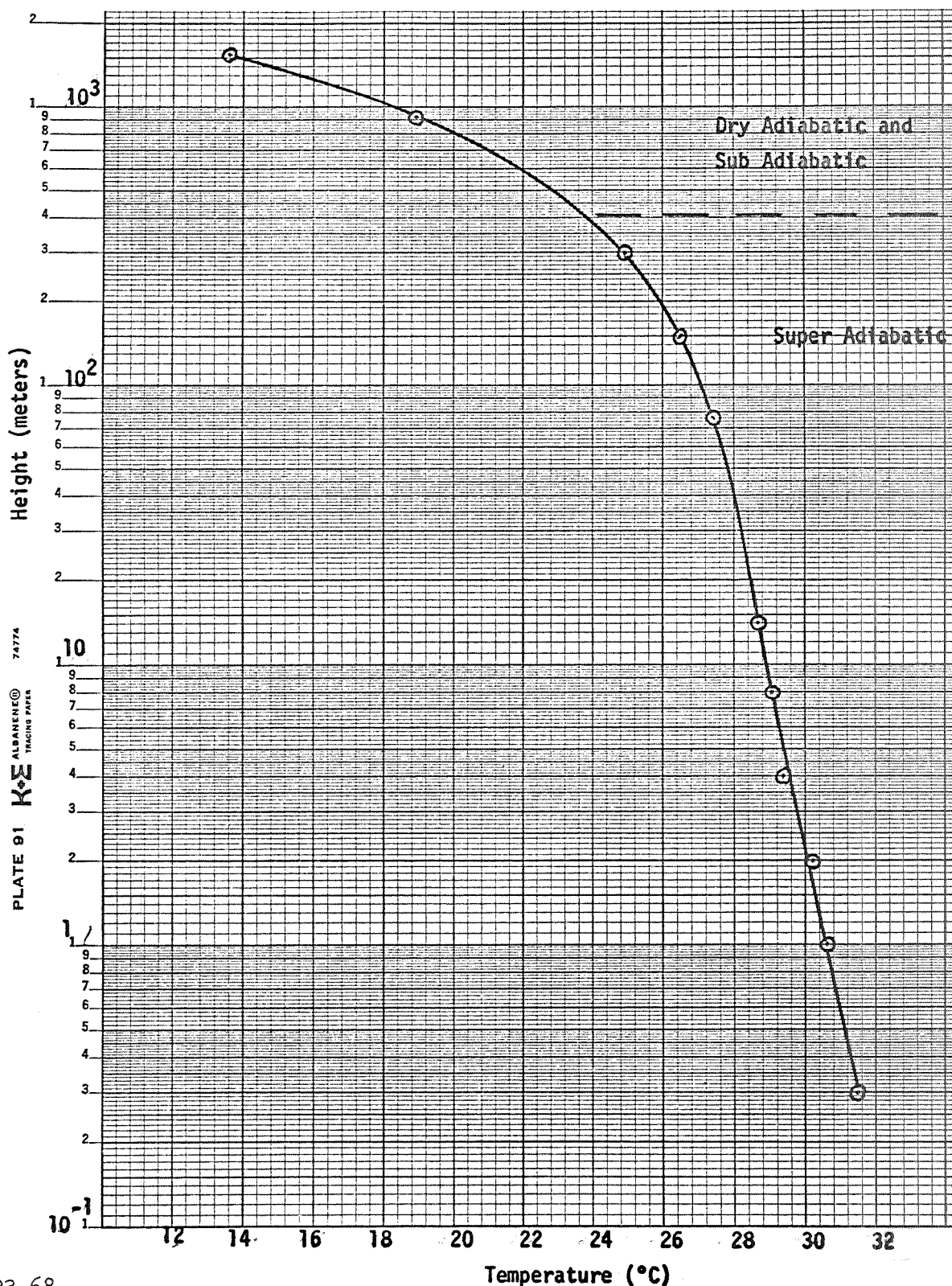
8-23-68

1330 PDT



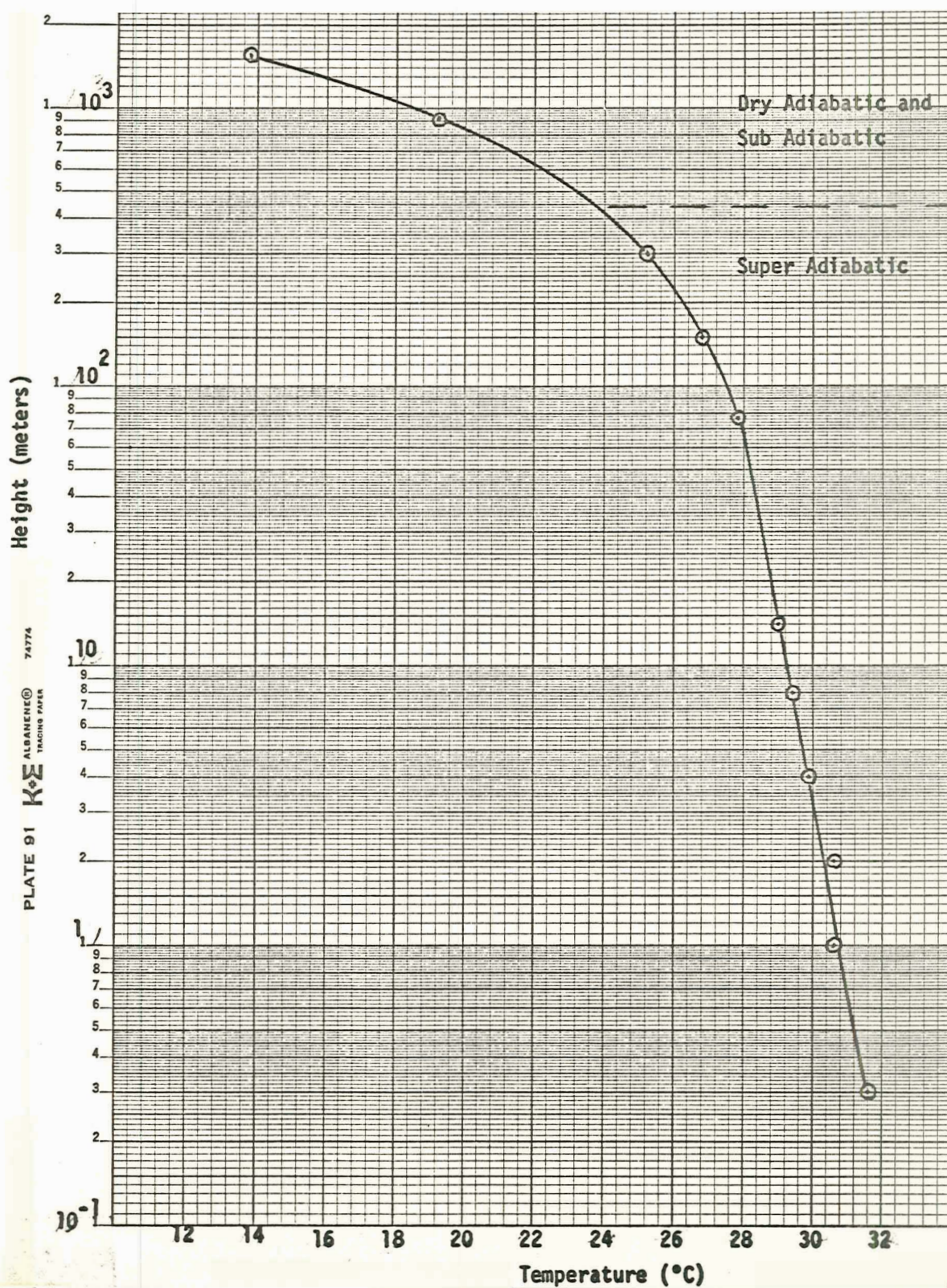
8-23-68

1345 PDT



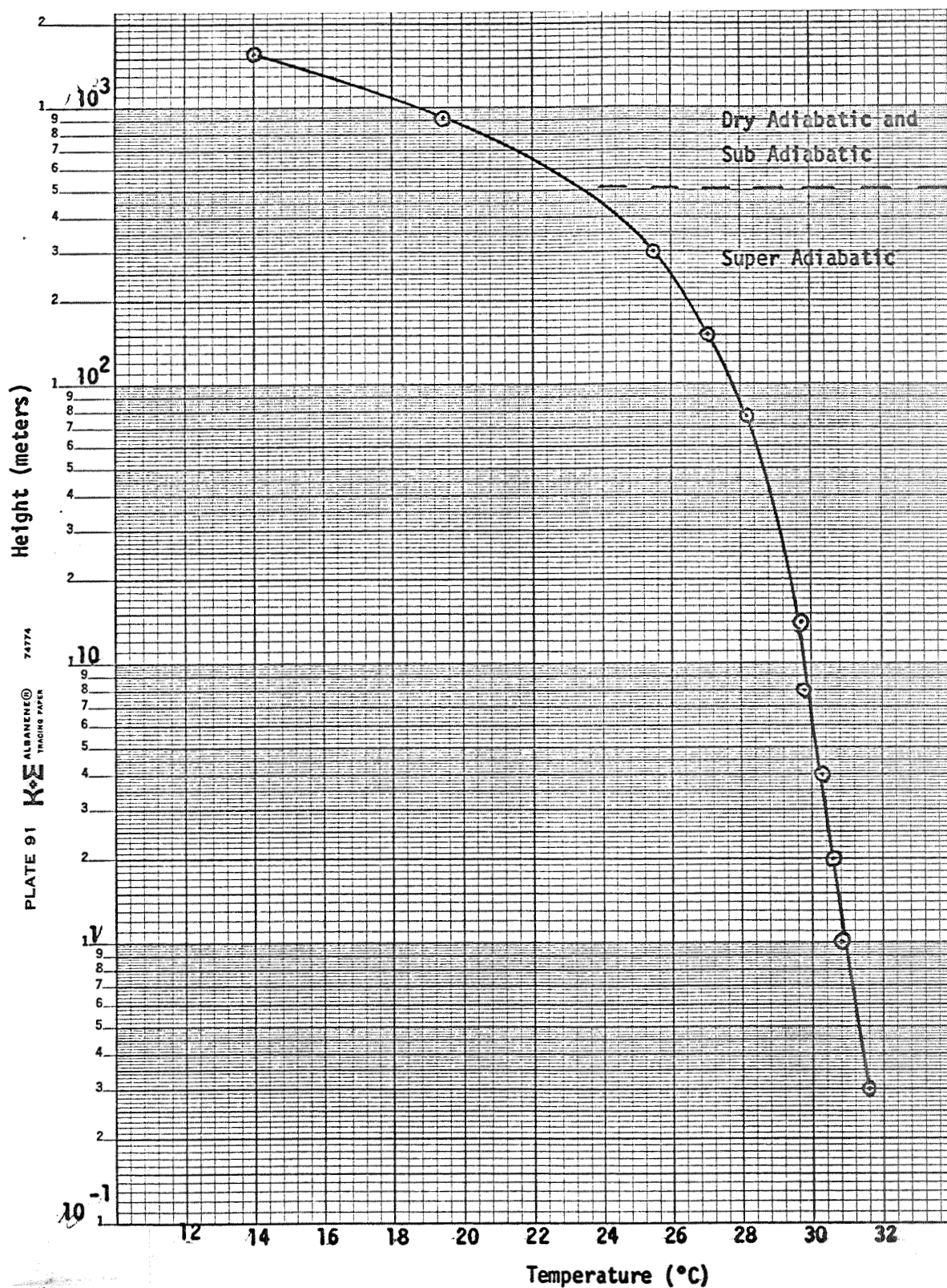
8-23-68

1400 PDT



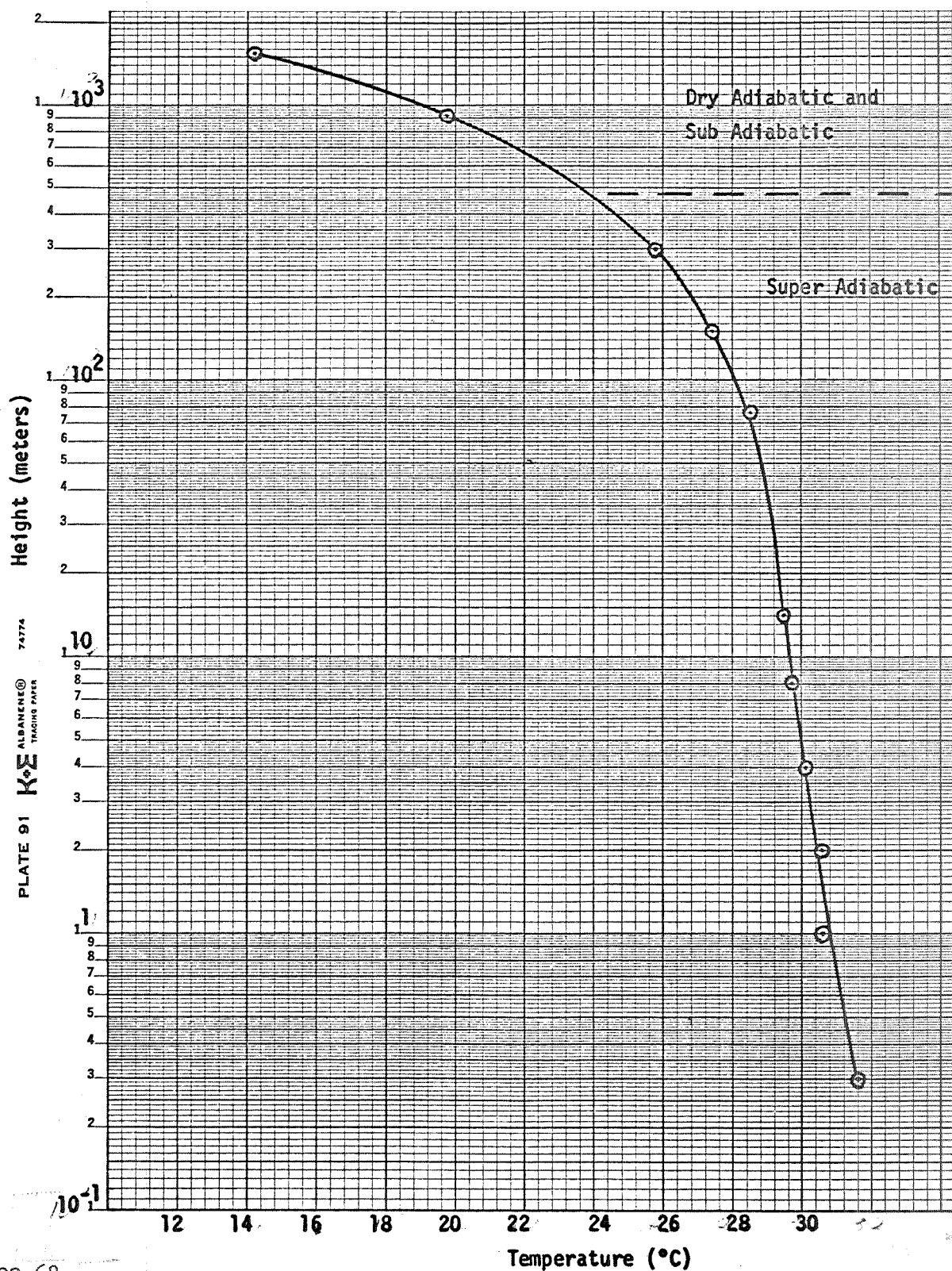
8-23-68

1415 PDT



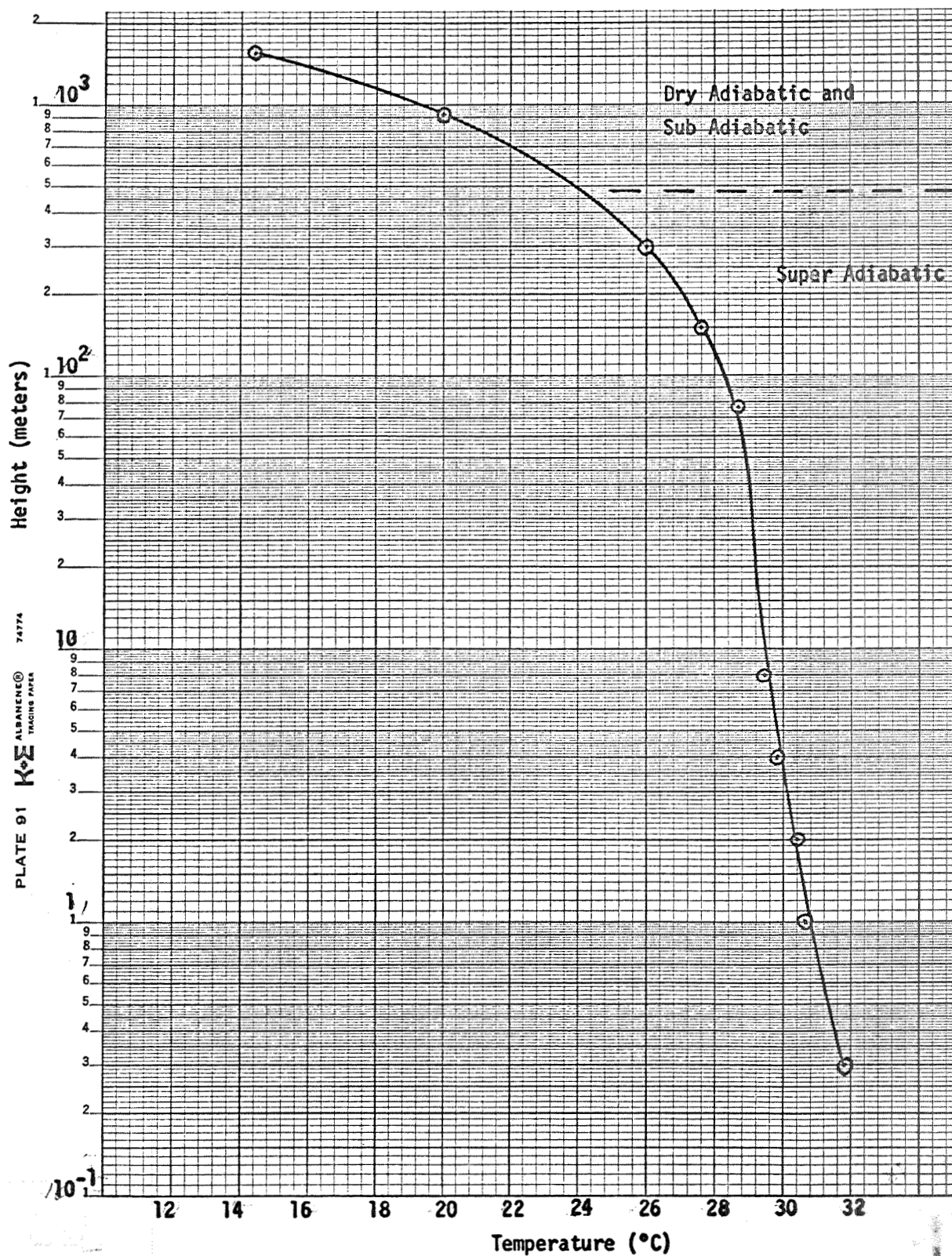
8-23-68

1430 PDT



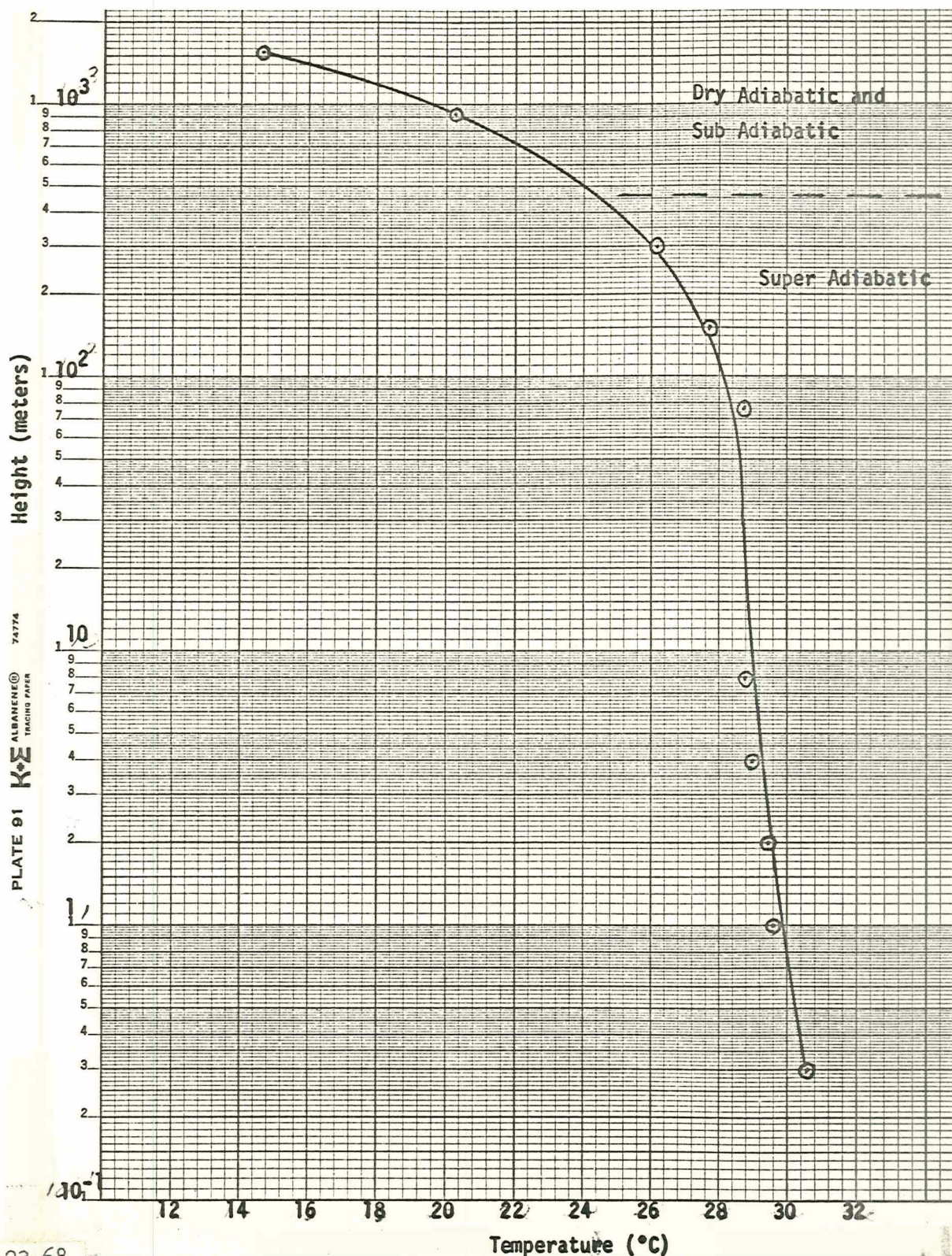
8-23-68

1445 PDT



8-23-68

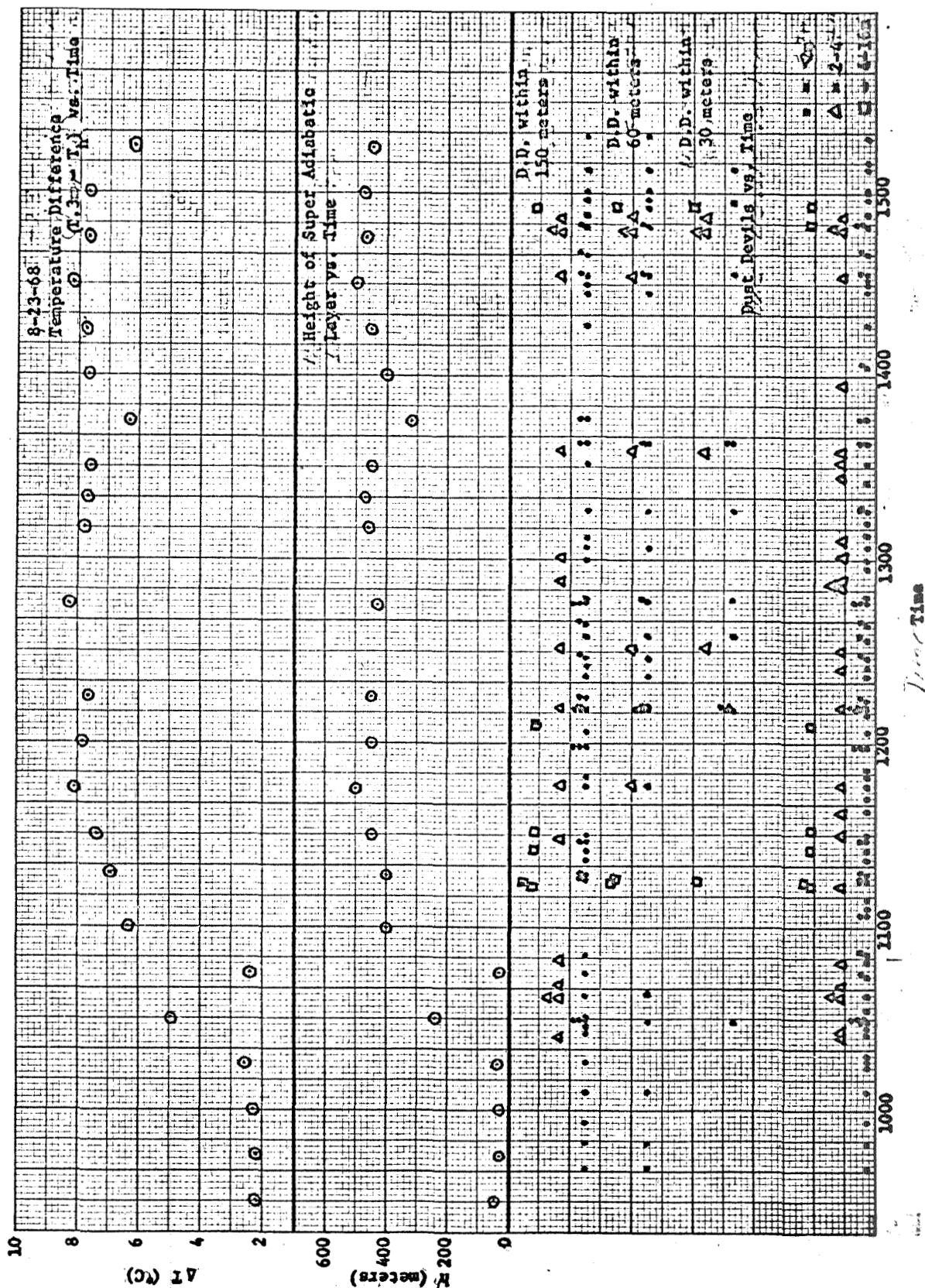
1500 PDT

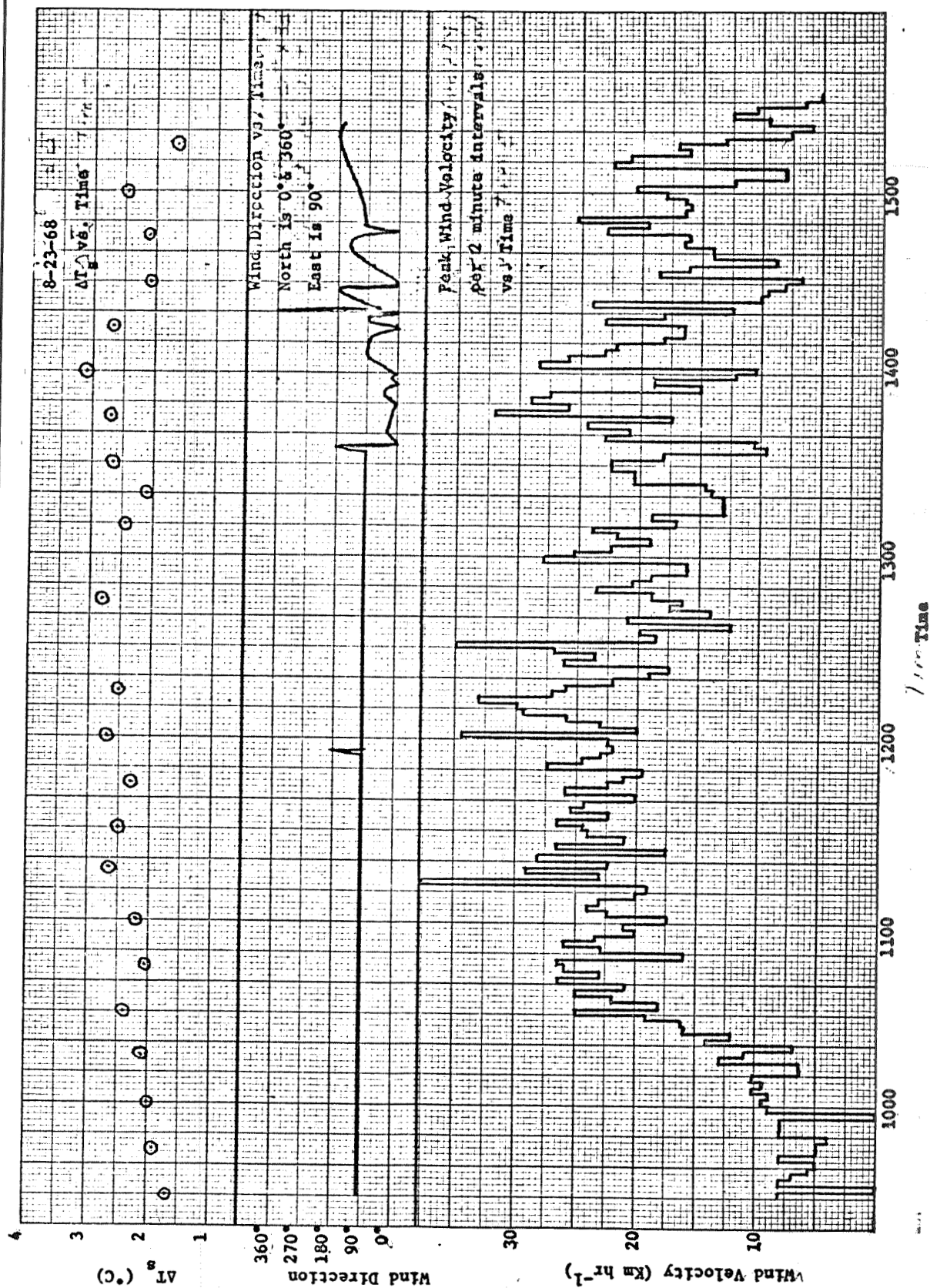


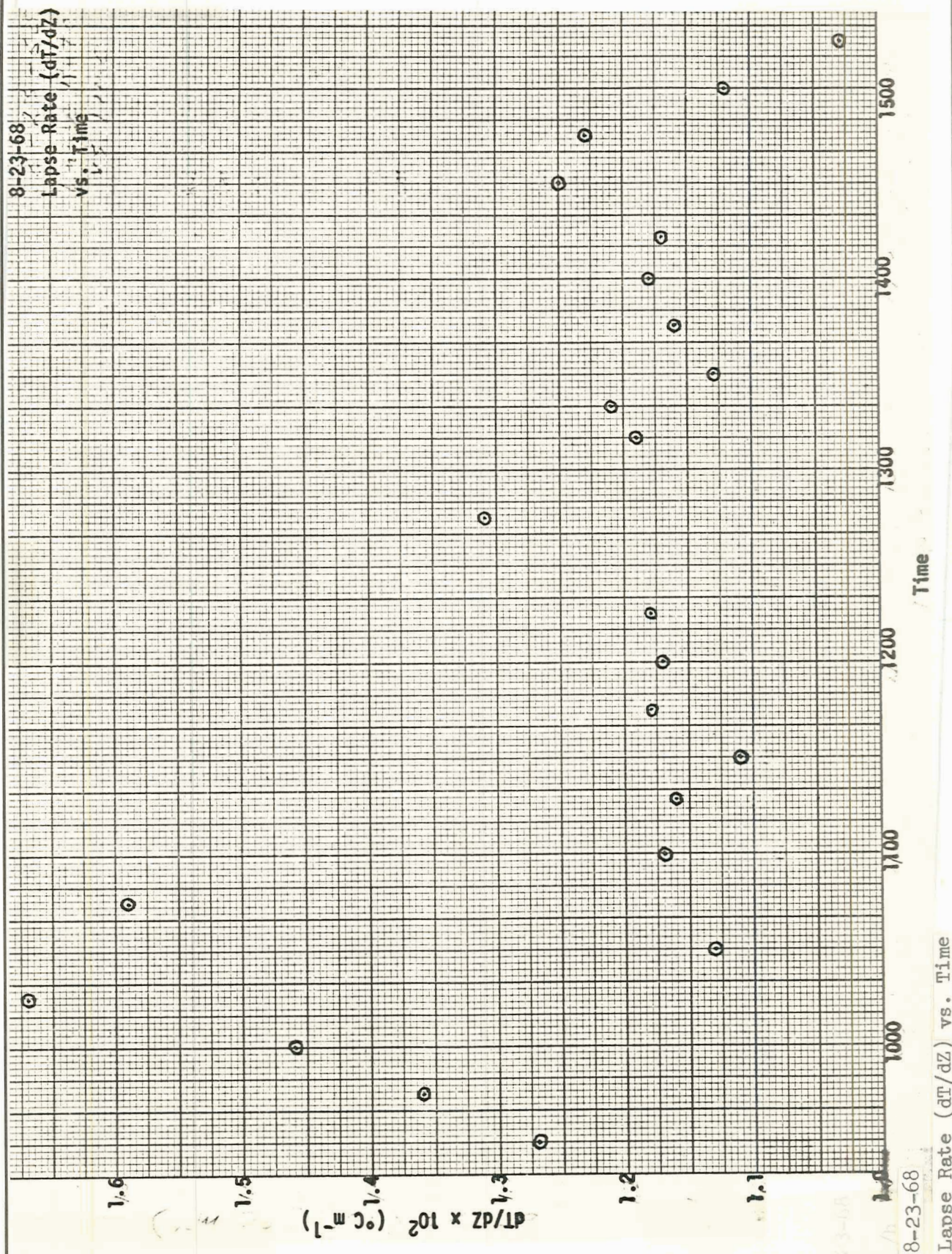
8-23-68

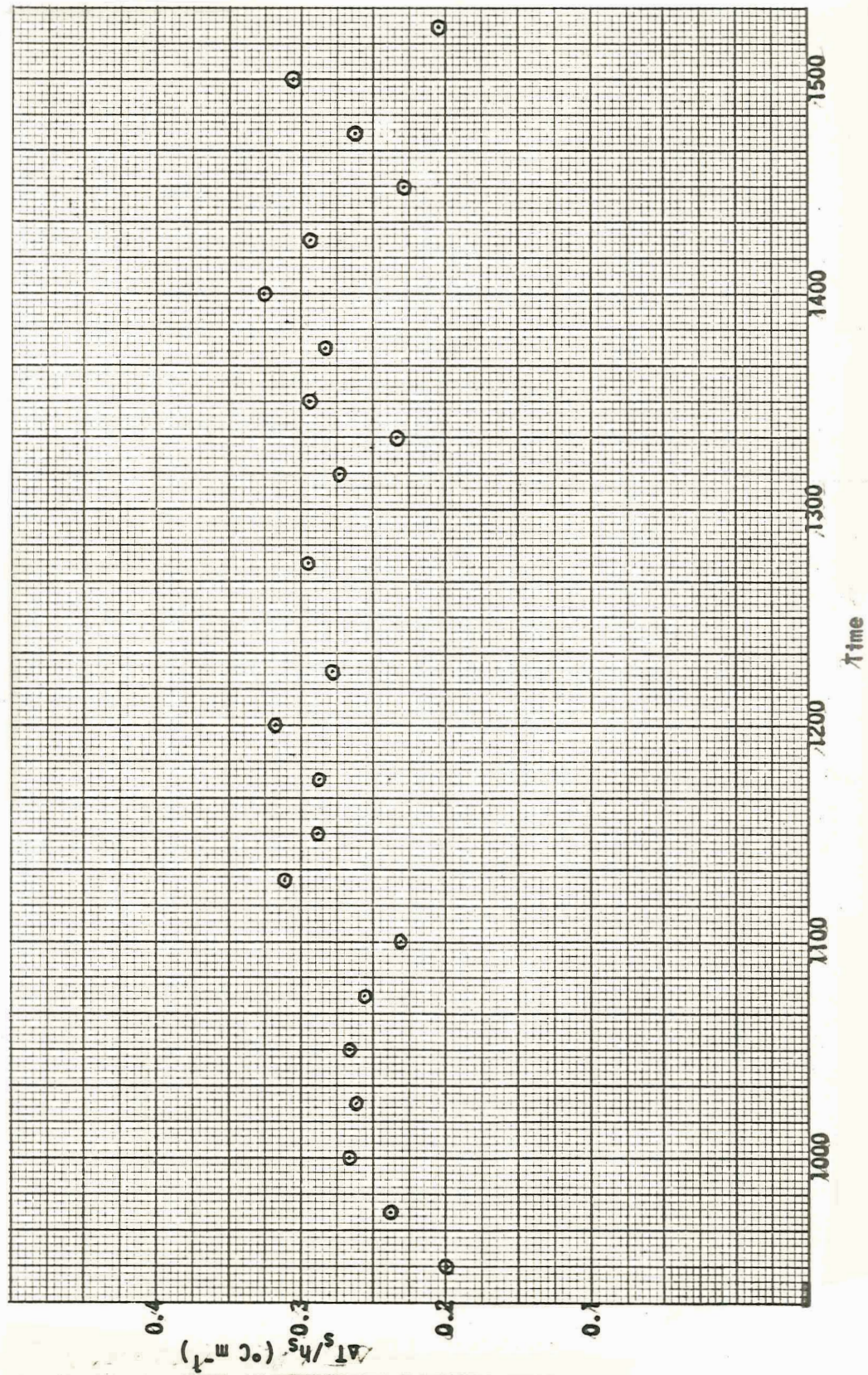
1515 PDT

30-692-9 (8-68)







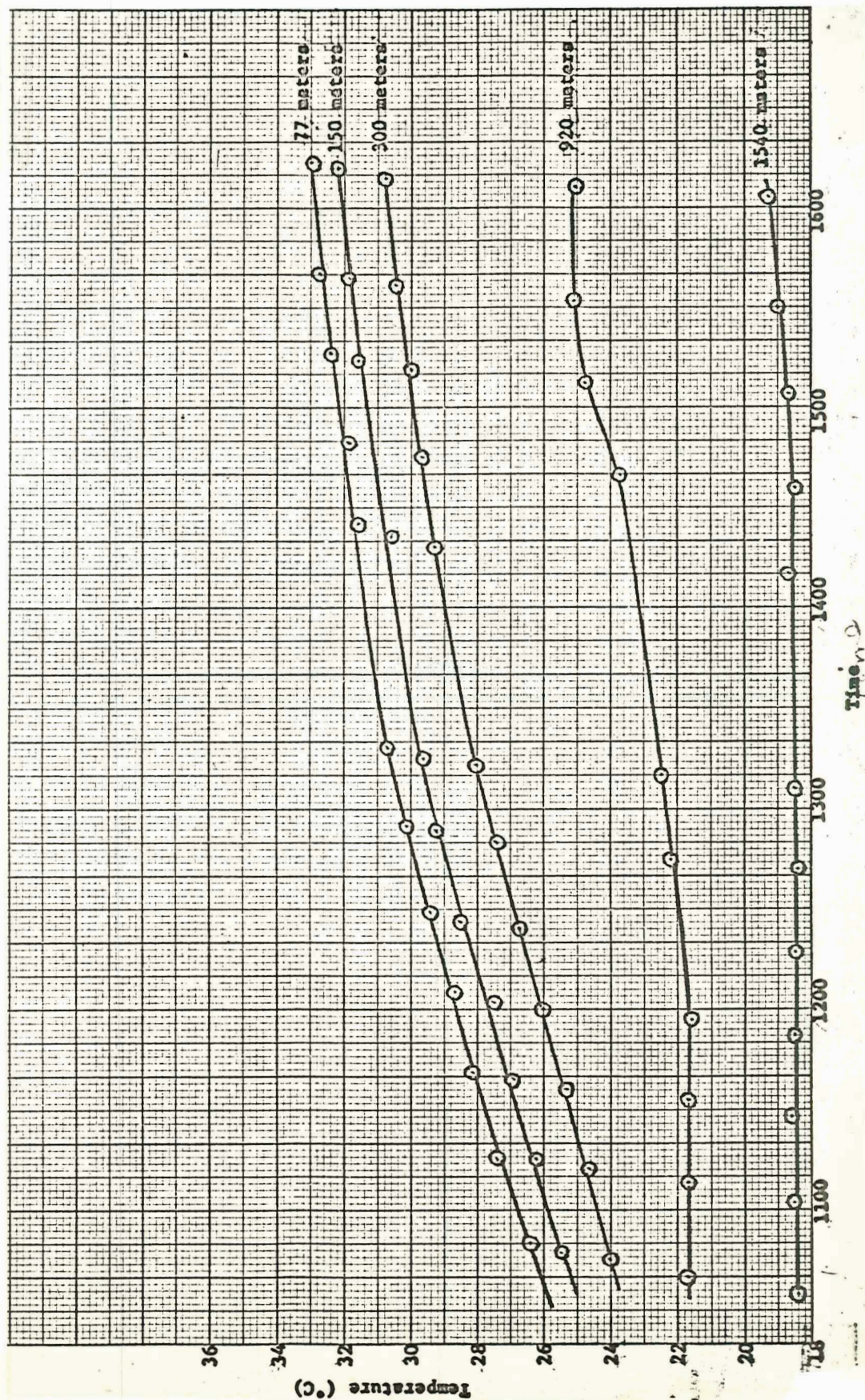


8-23-68

$\Delta T_s / h_s$ vs. Time

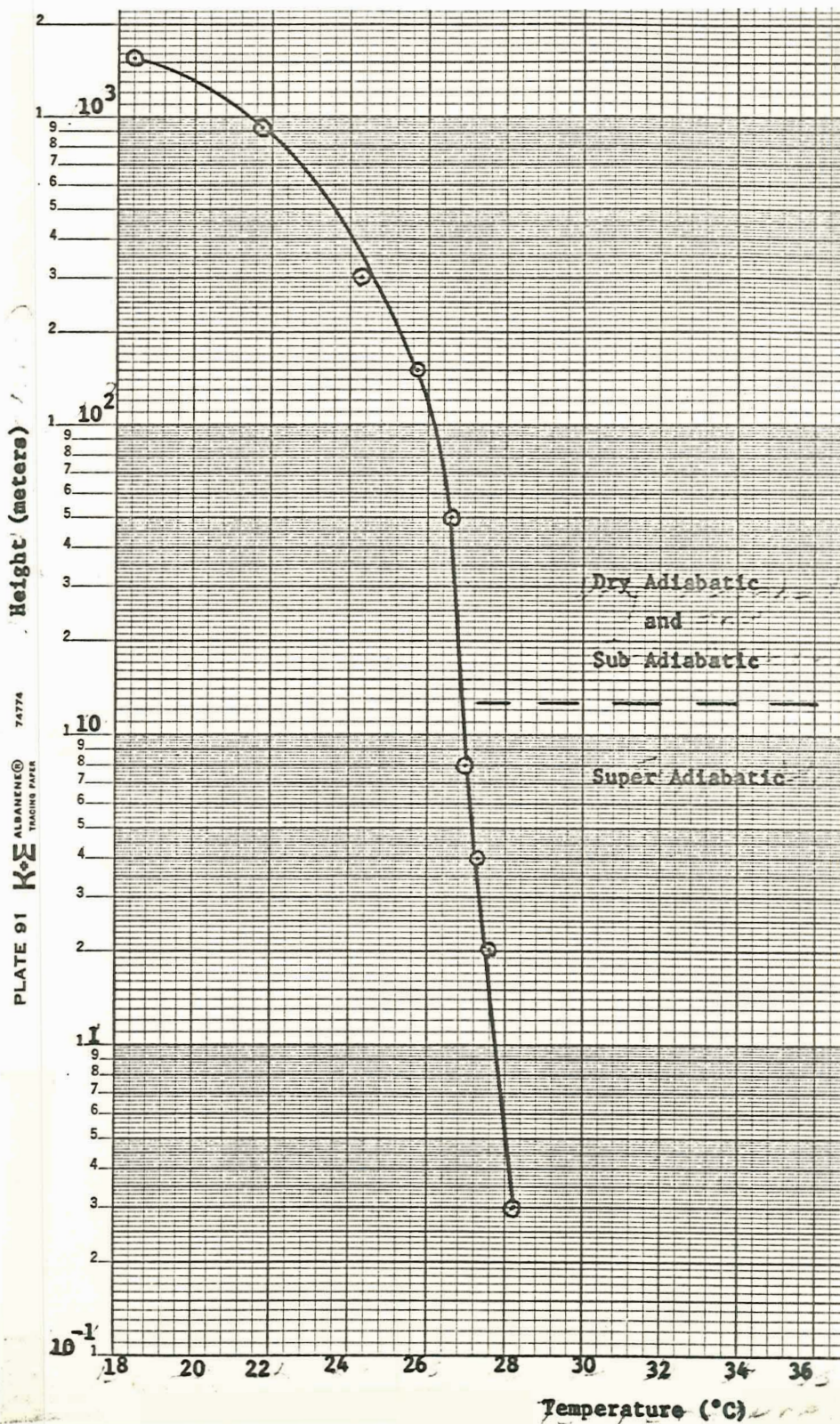
DATA FOR 8-28-68

30-692-9 (8-68)



8-28-68

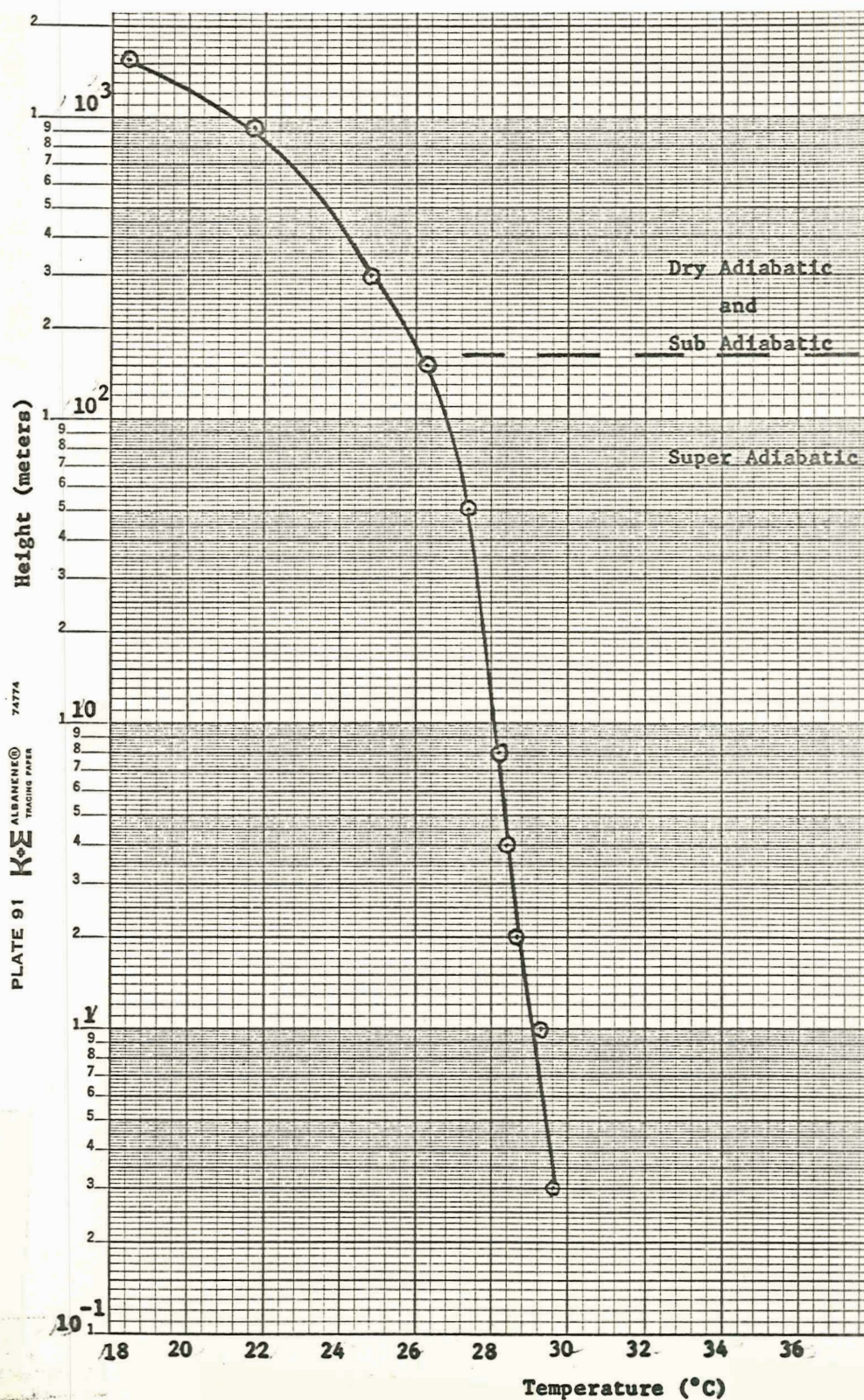
Aircraft Soundings



8-28-68

1055 PDT

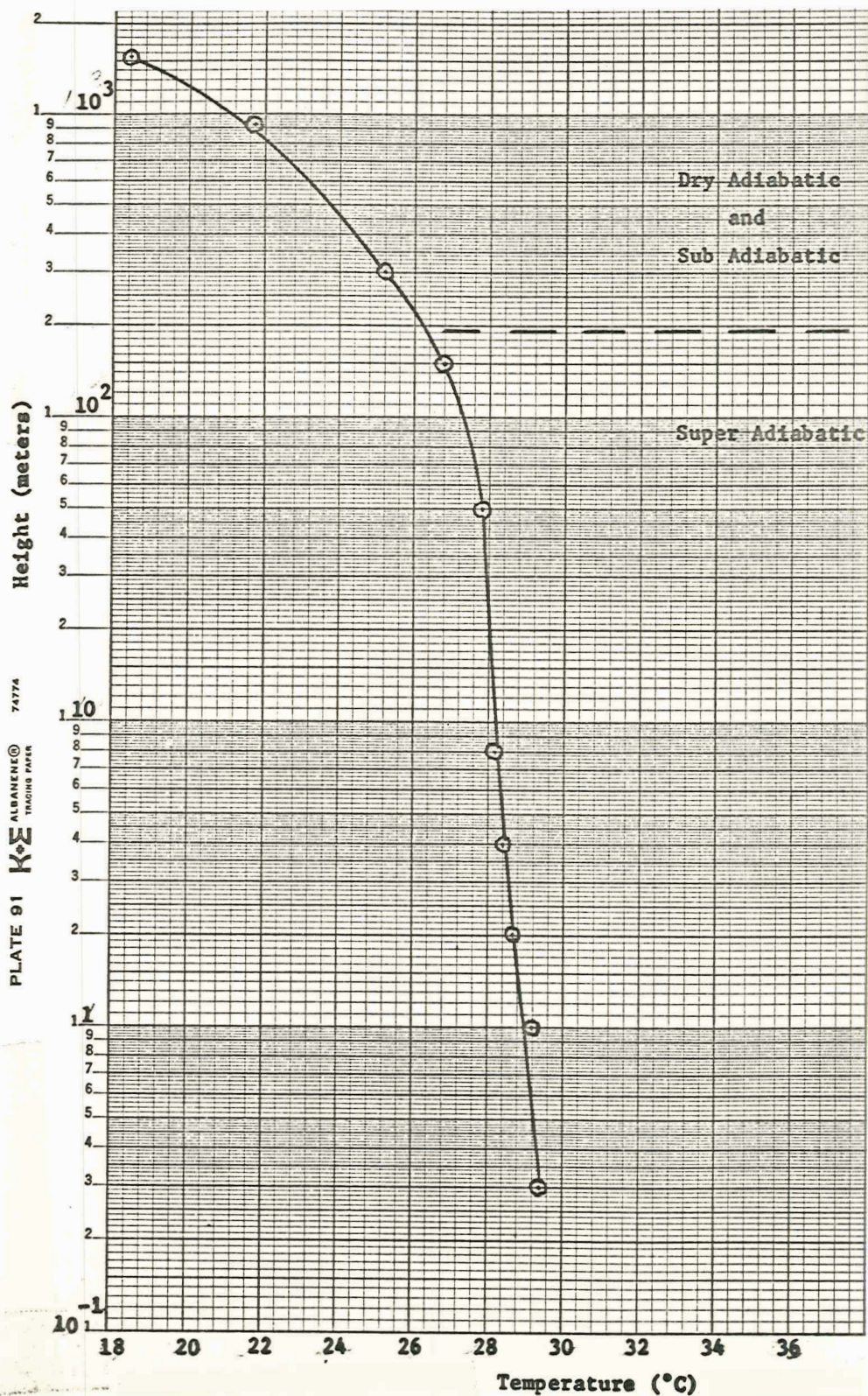
1 30-692-6 (8-68)



8-28-68

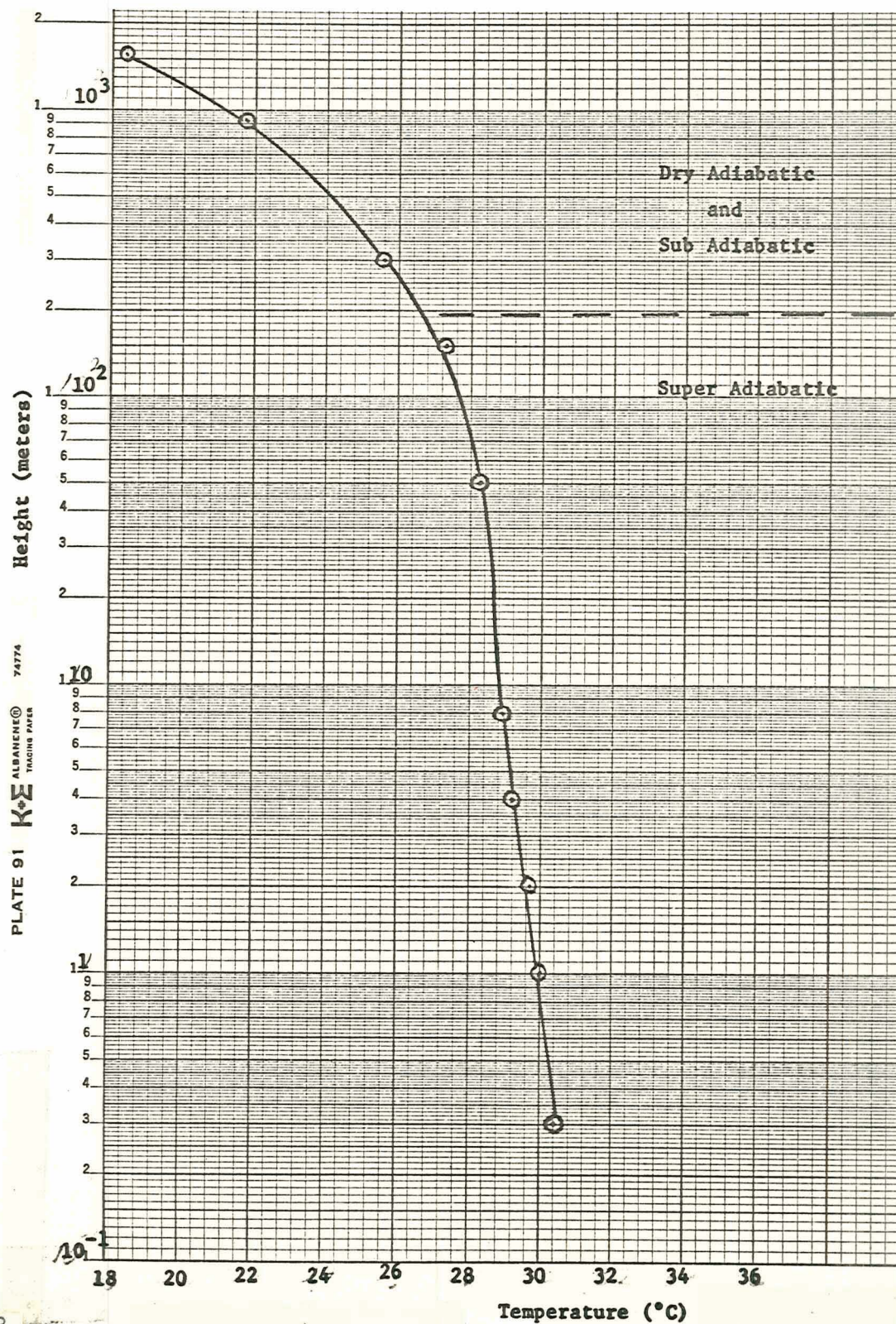
1115 PDT

30-692-6 (8-68)



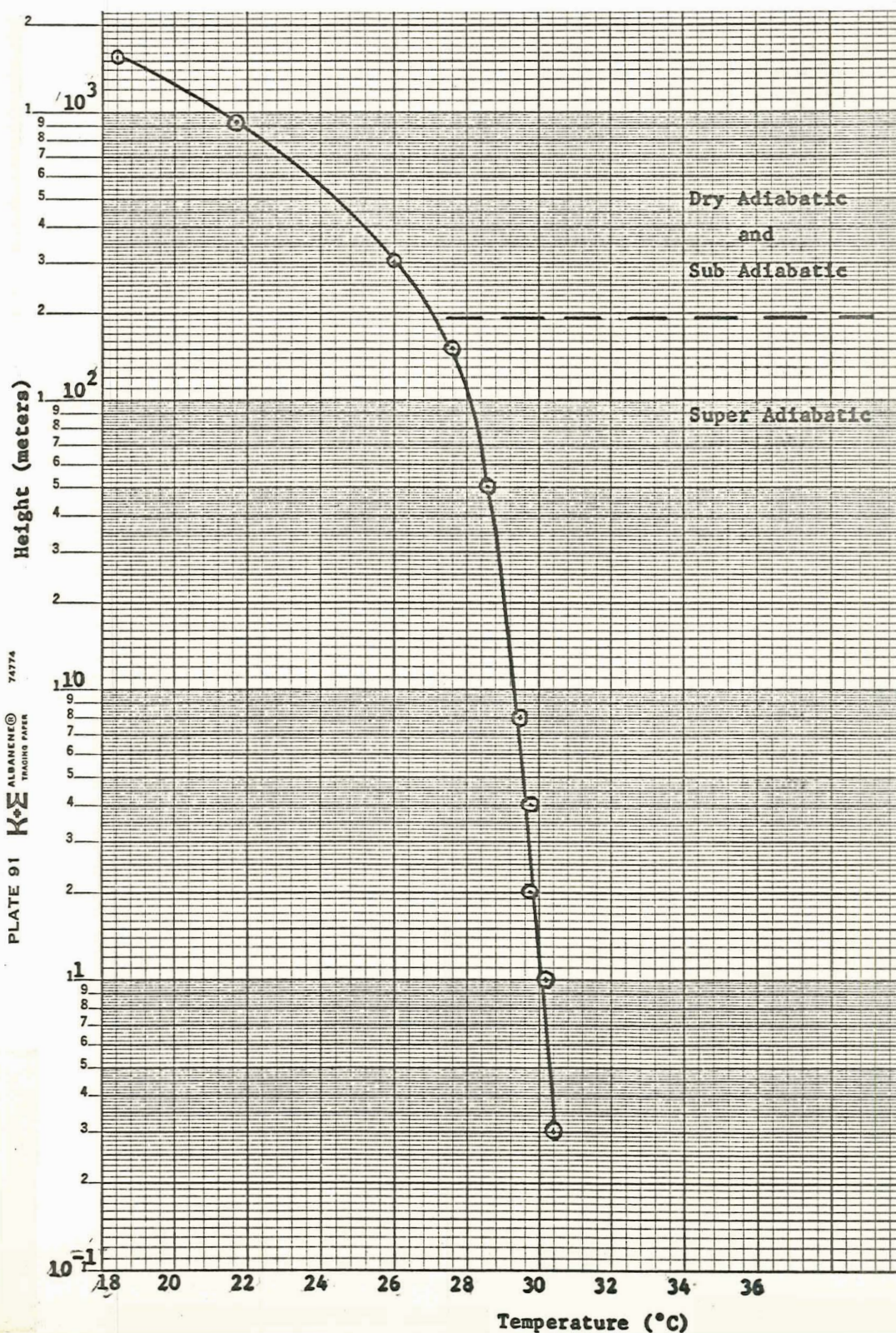
8-28-68

1130 PDT



8-28-68

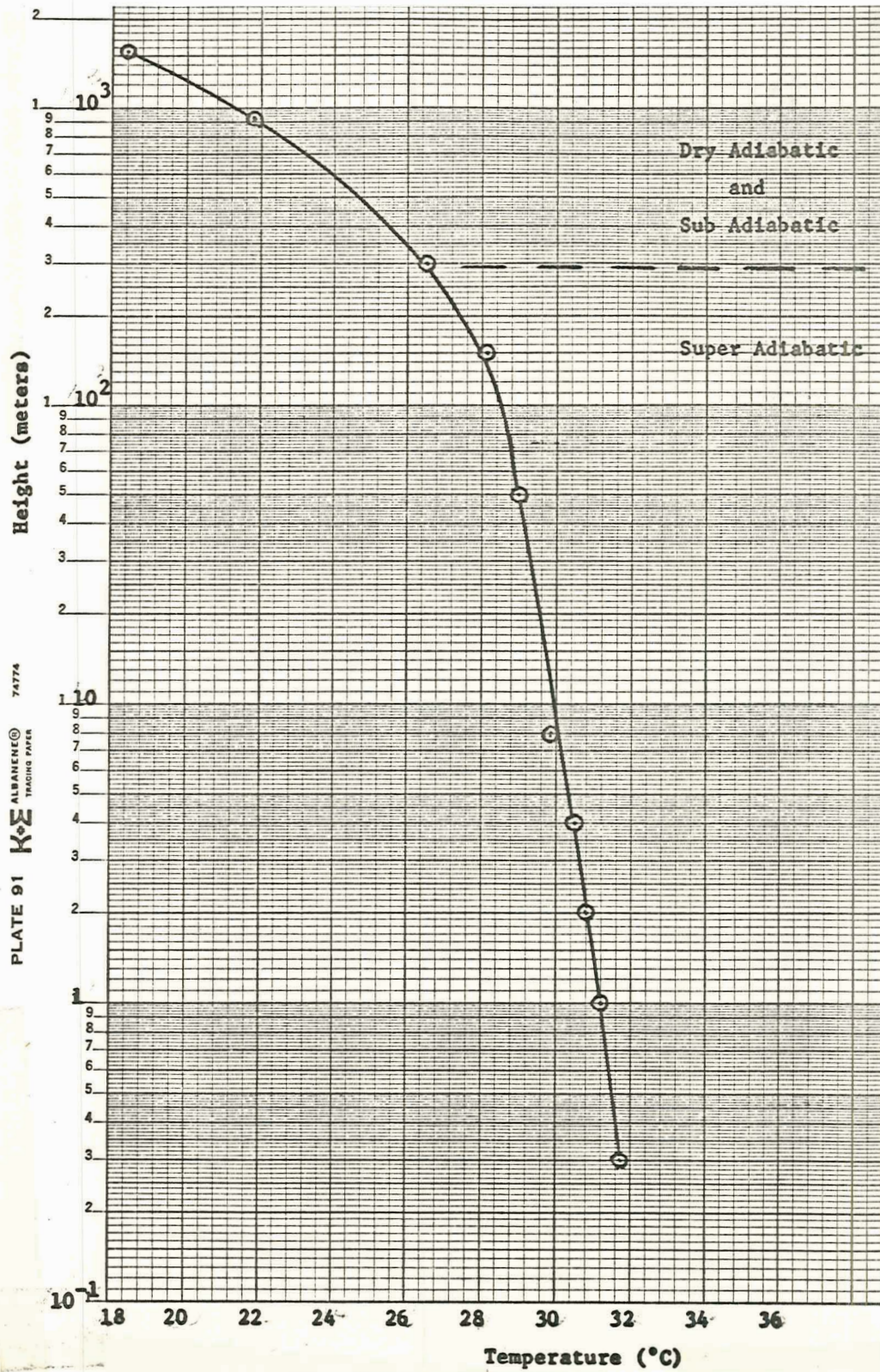
1145 PDT



8-28-68

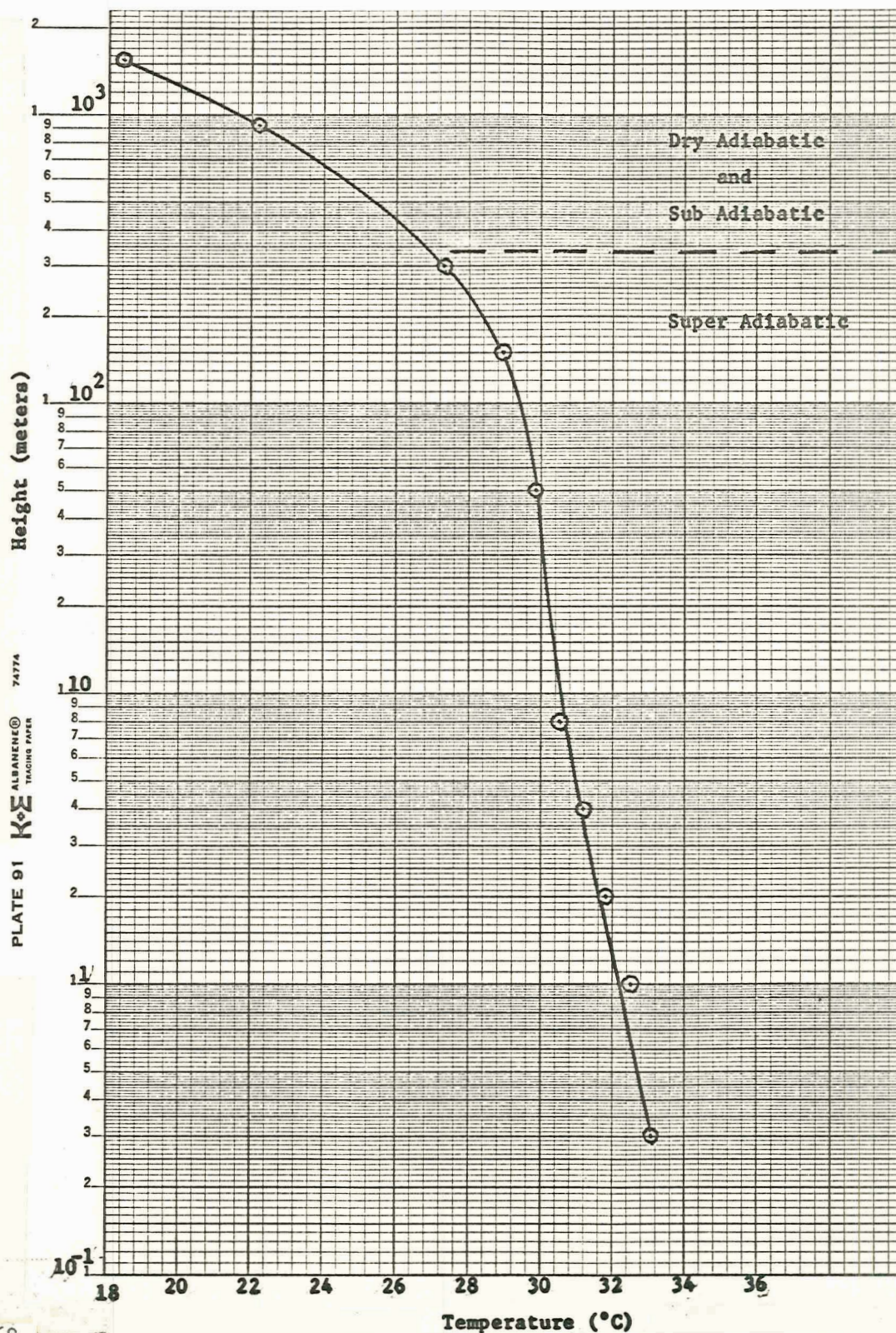
1200 PDT

30-692-6 (8-68)



8-28-68

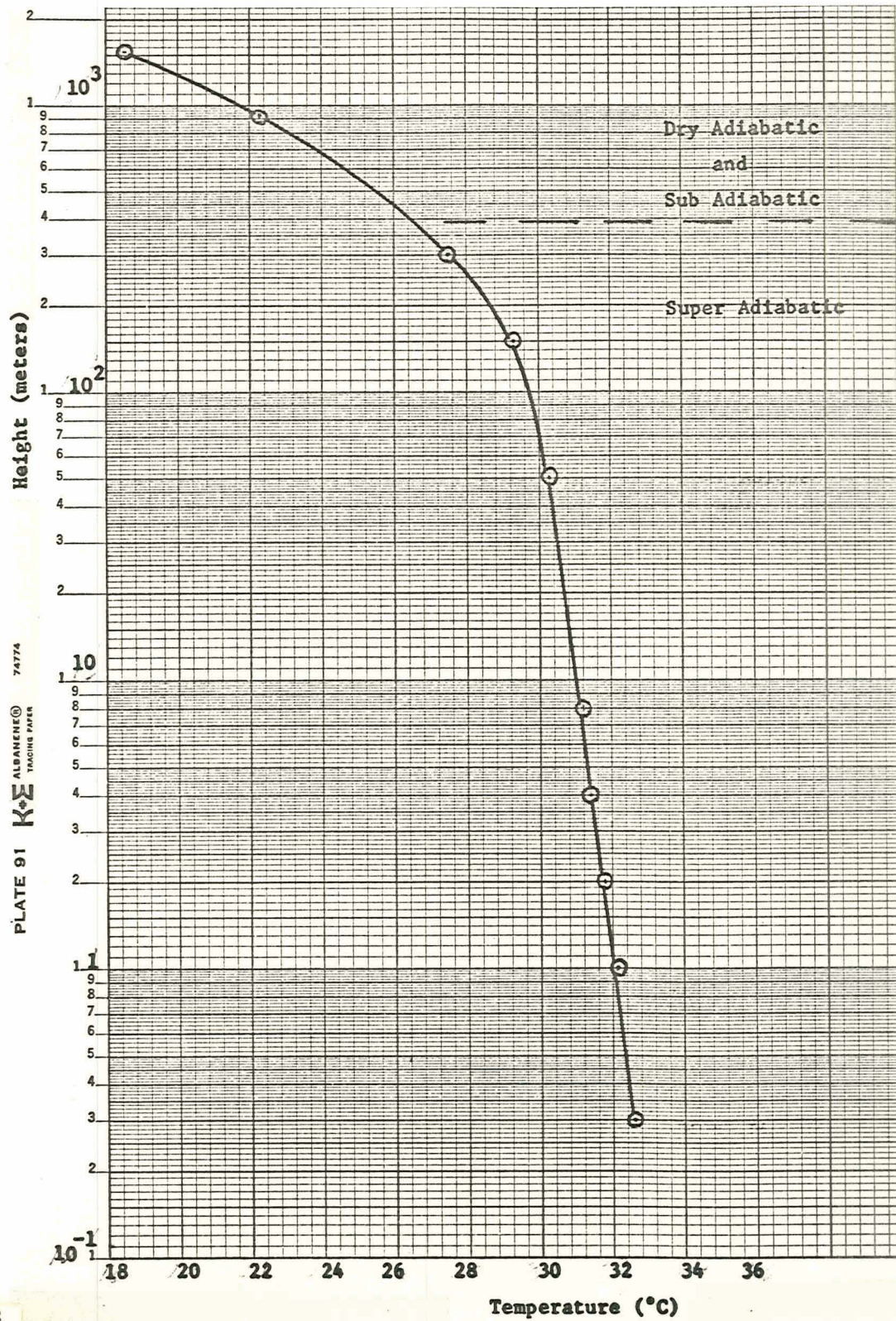
1215 PDT



8-28-68

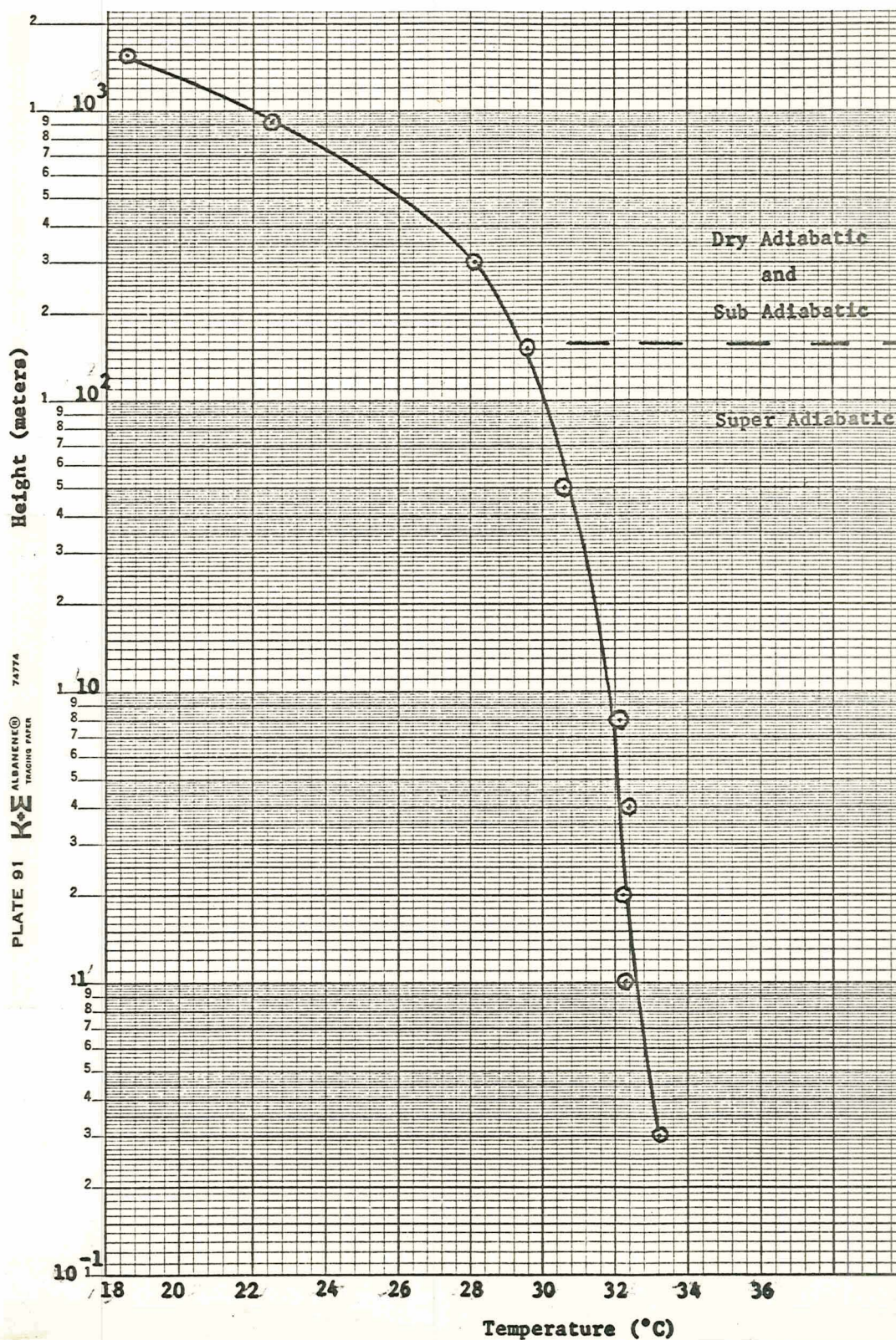
1245 PDT

M 30-692-6 (8-68)



8-28-68

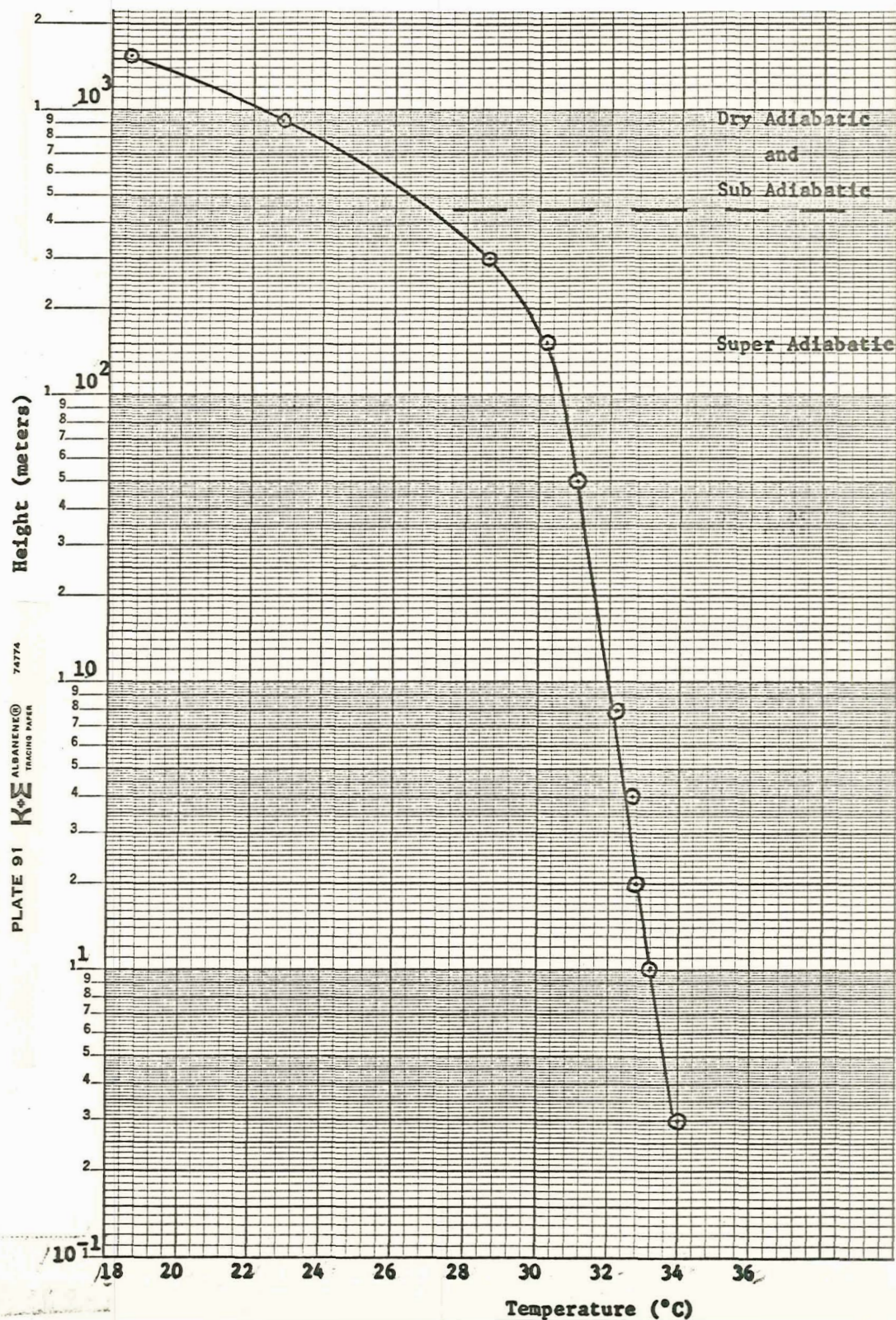
1300 PDT



8-28-68

1315 PDT

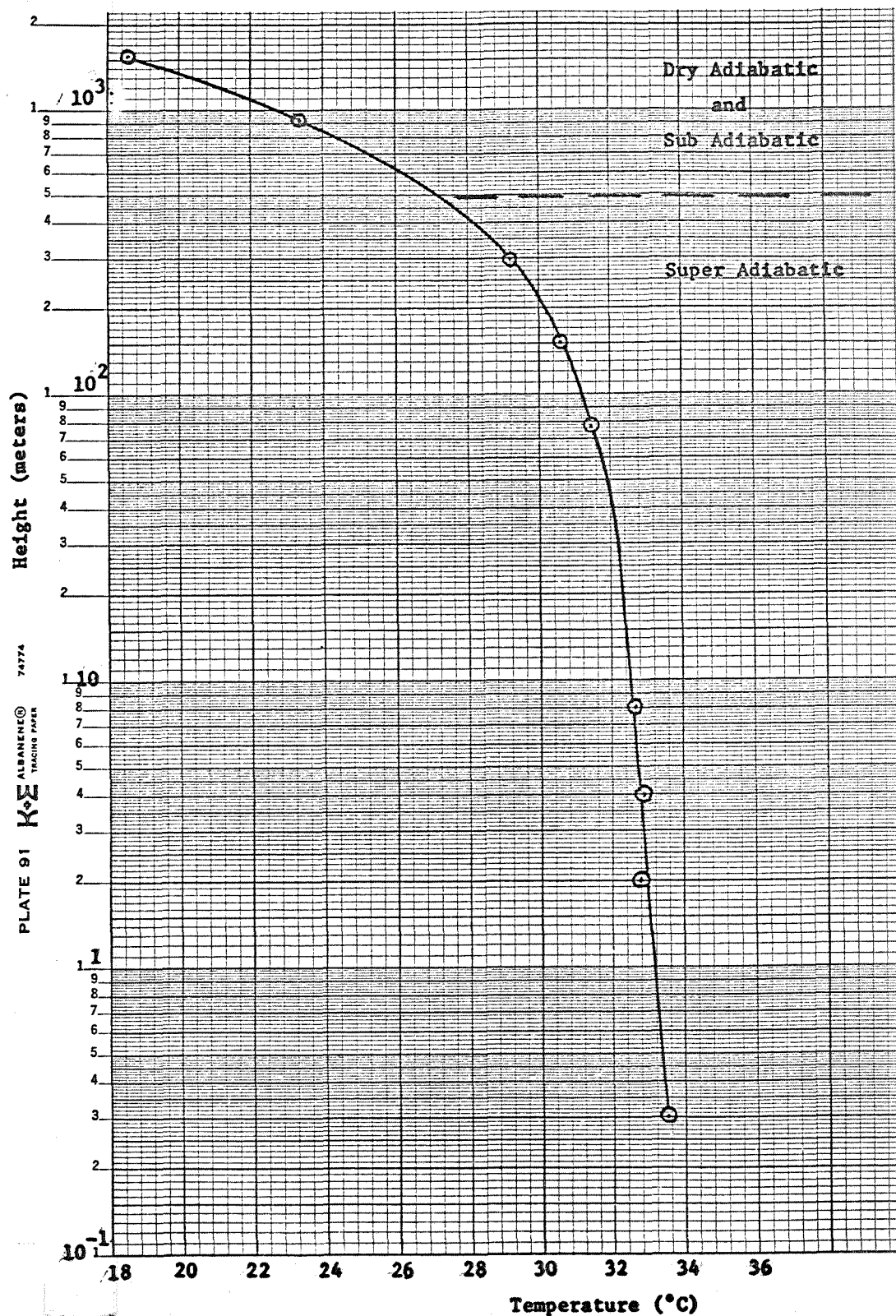
30-692-6 (8-68)



8-28-68

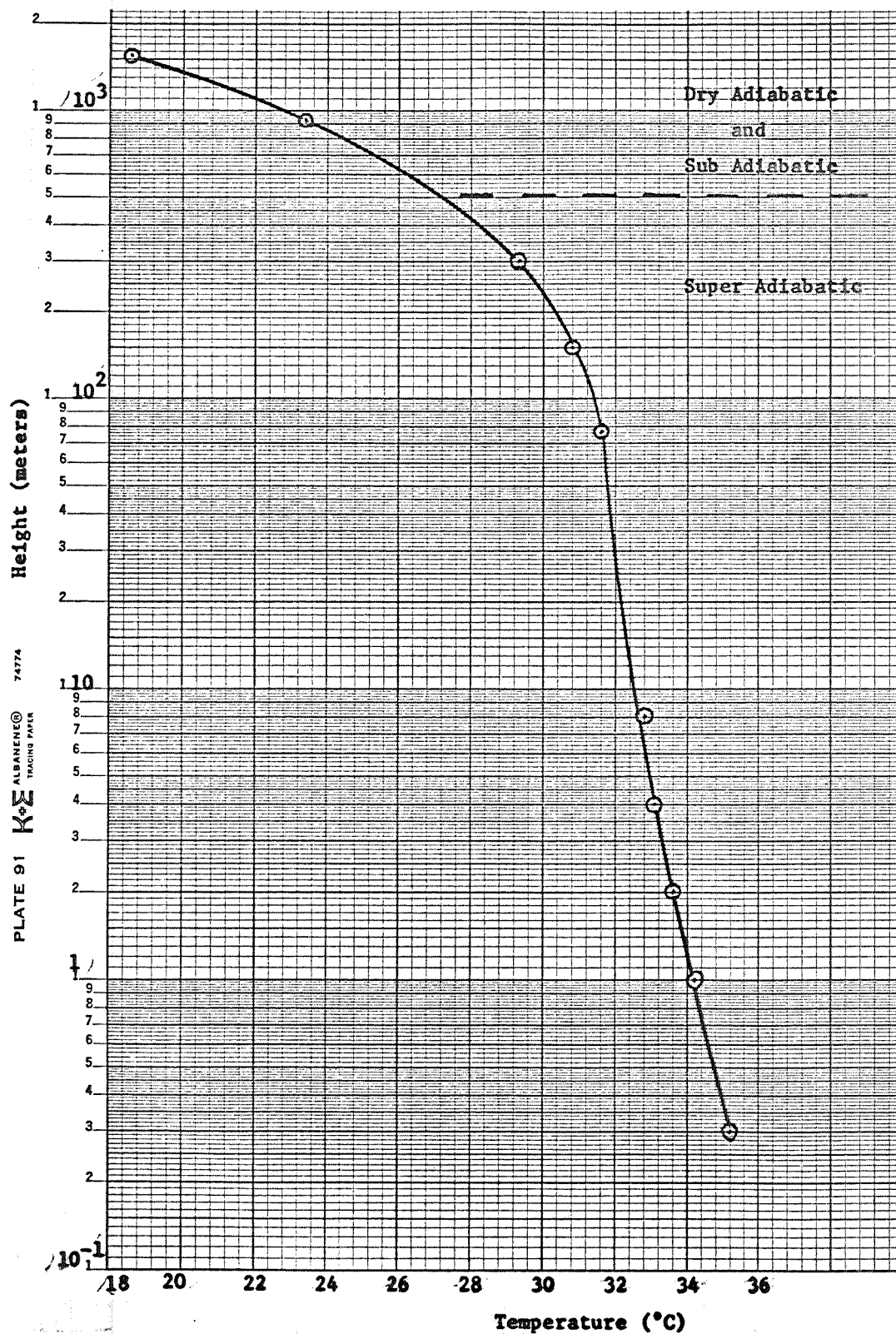
1340 PDT

M 30-692-6 (8-68)



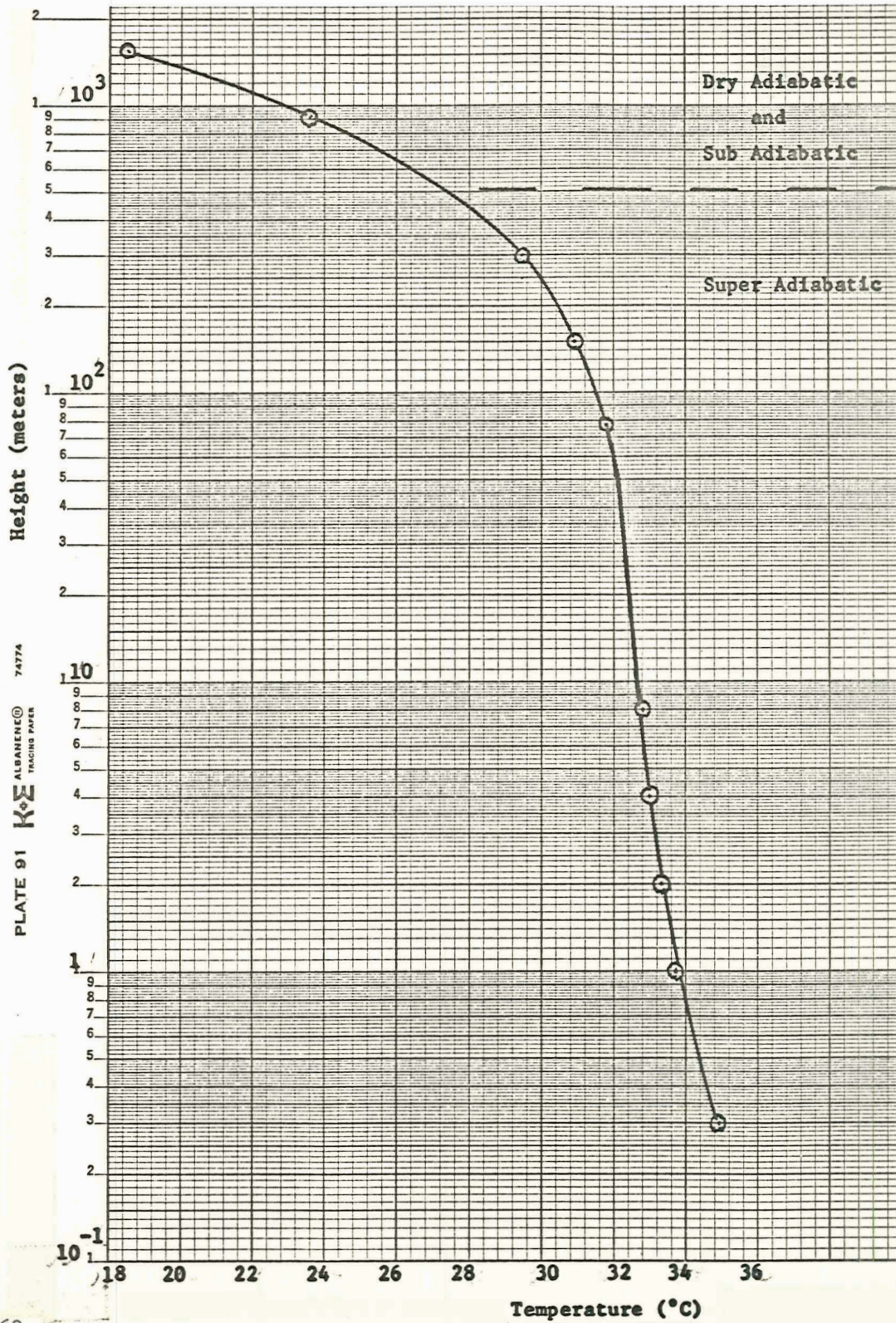
8-28-68

1410 PDT



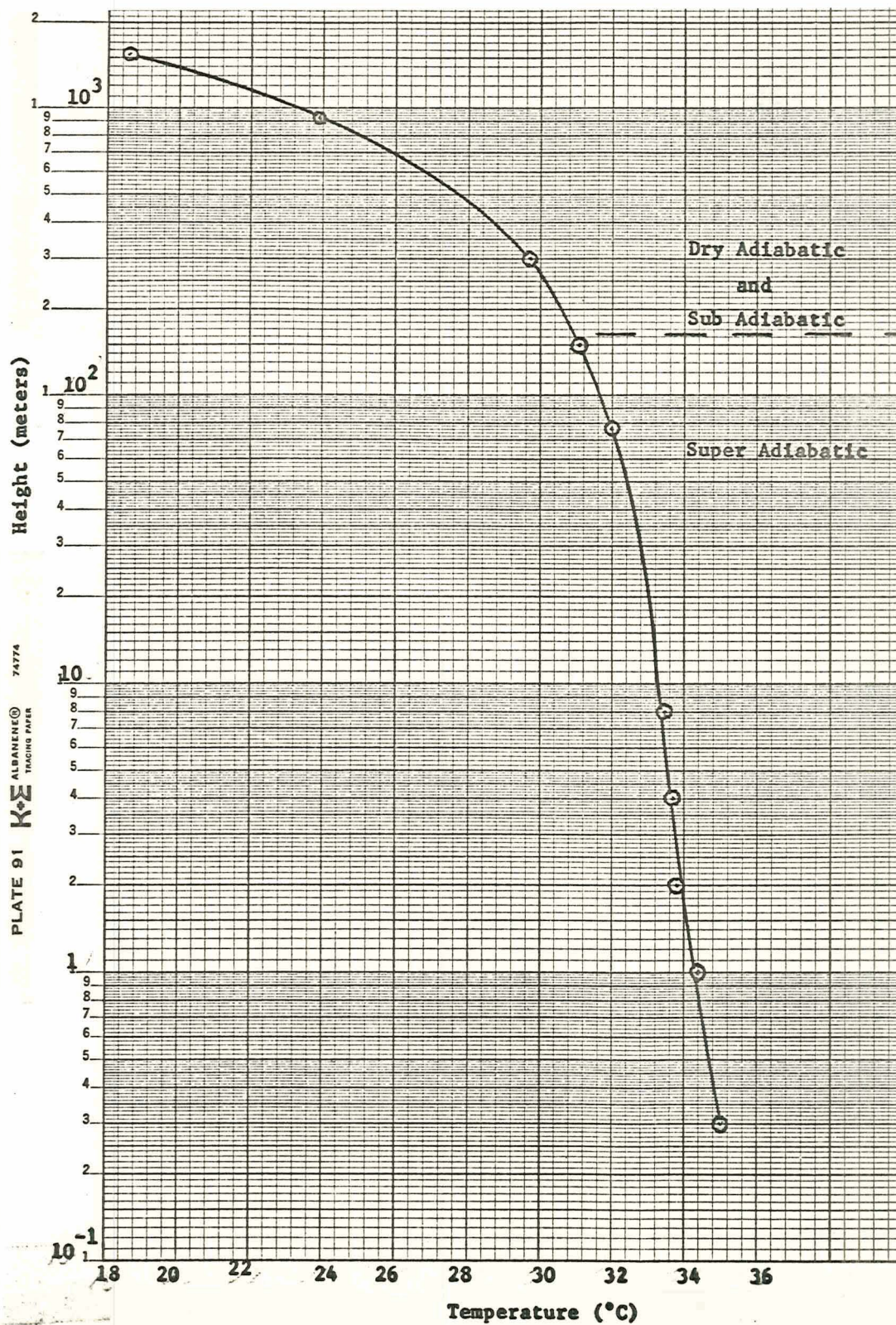
8-28-68

1420 PDT



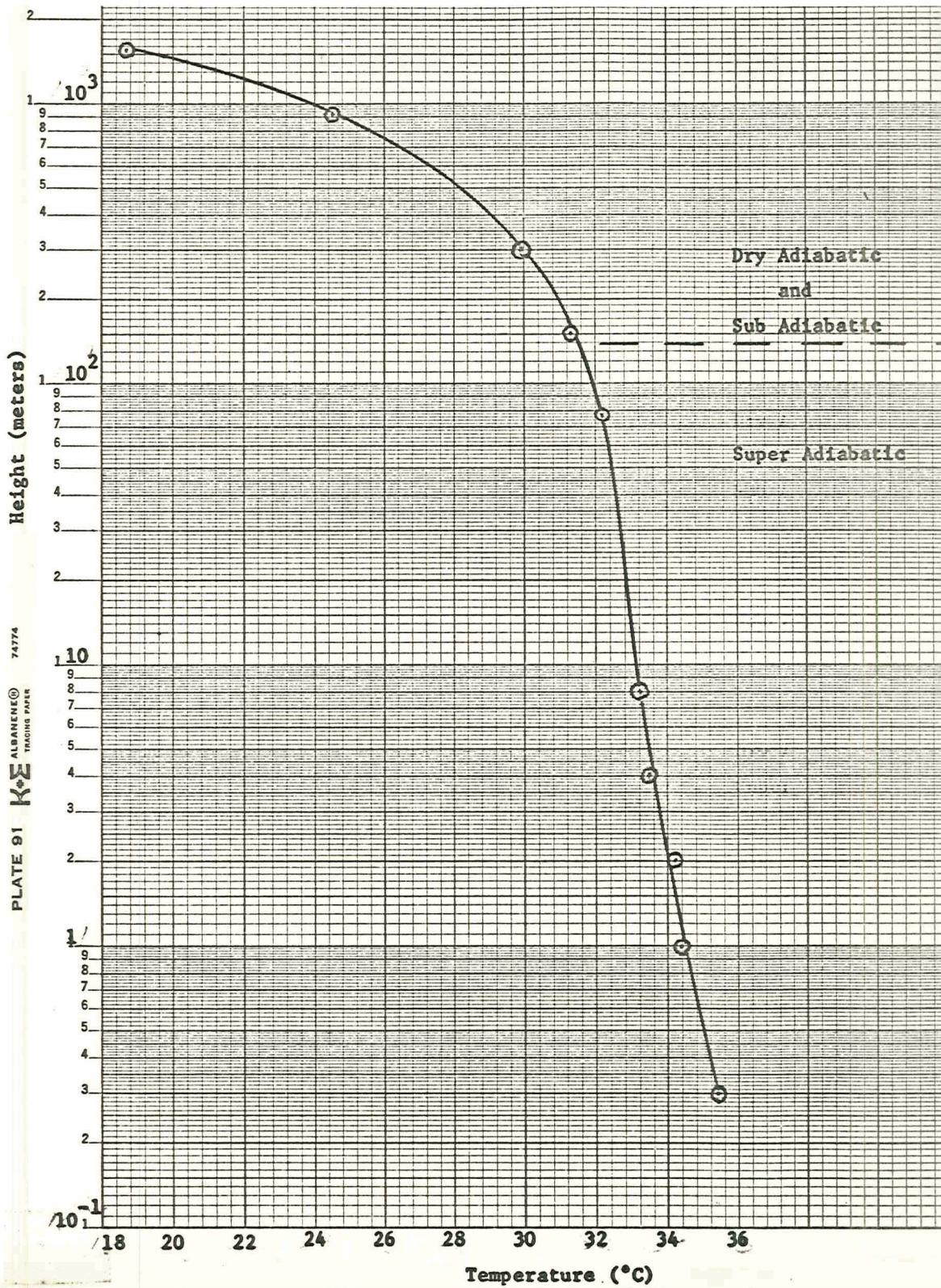
8-28-68

1430 PDT



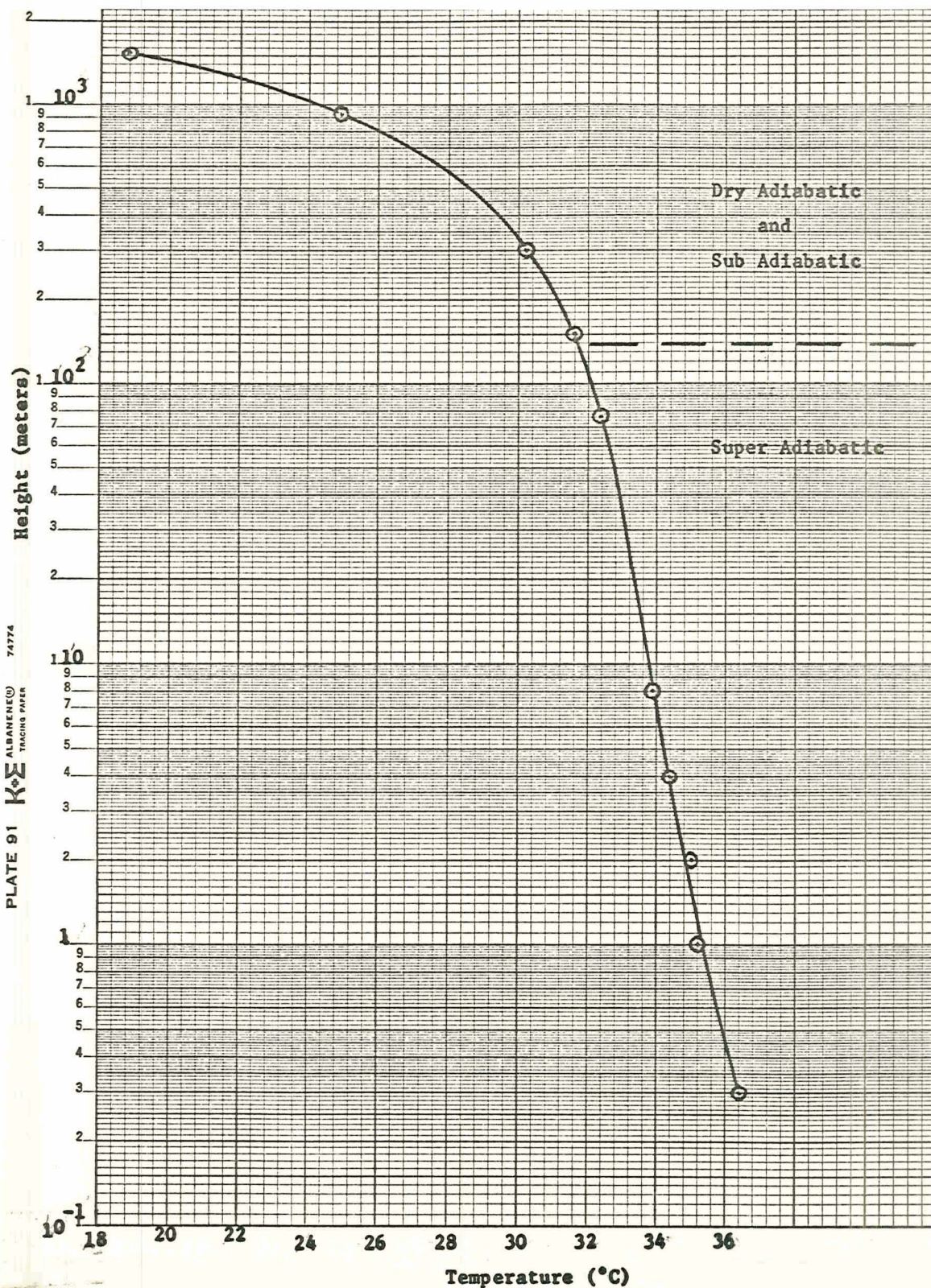
8-28-68

1445 PDT



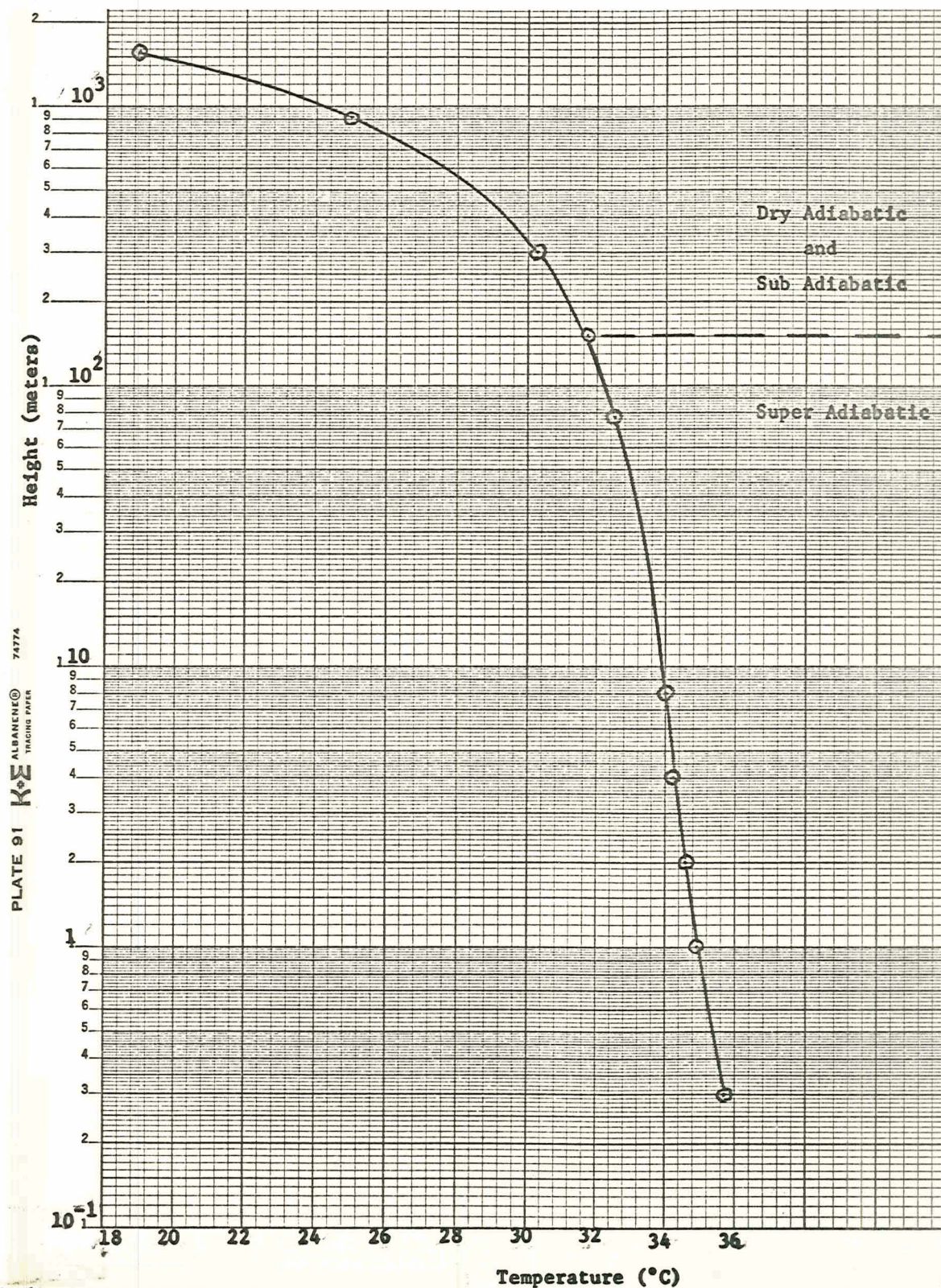
8-28-68

1500 PDT



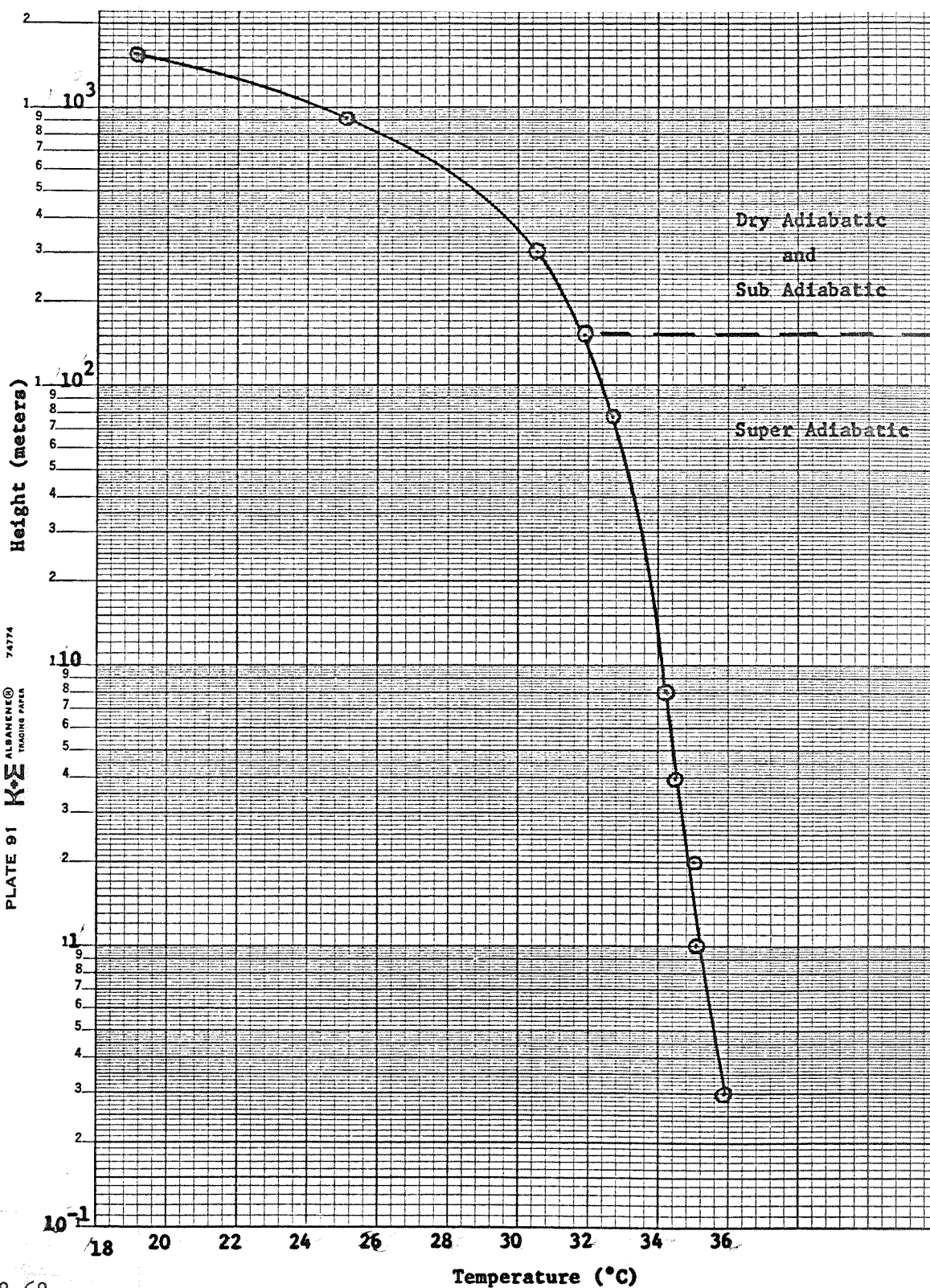
8-28-68

1518 PDT



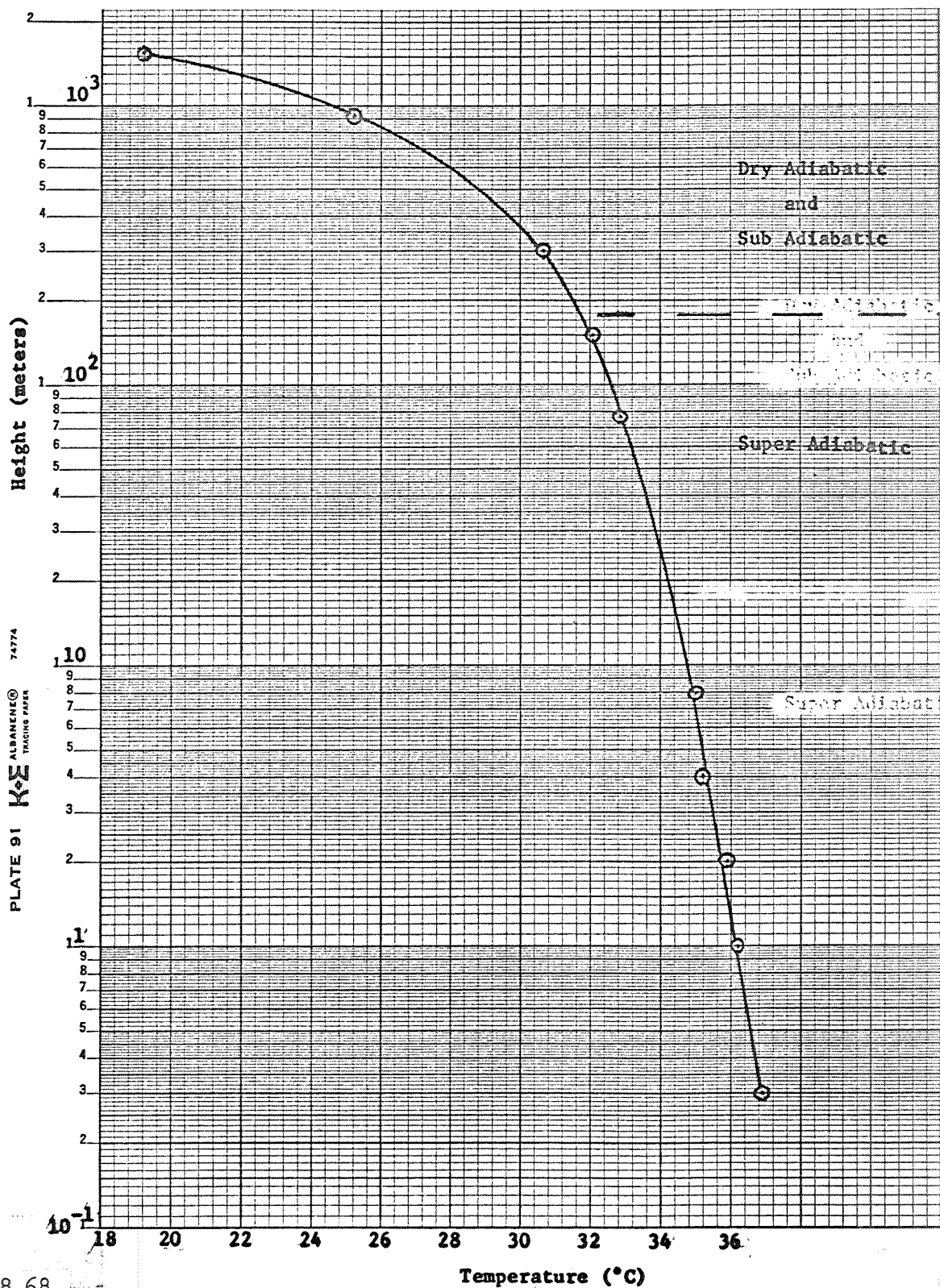
8-28-68

1530 PDT



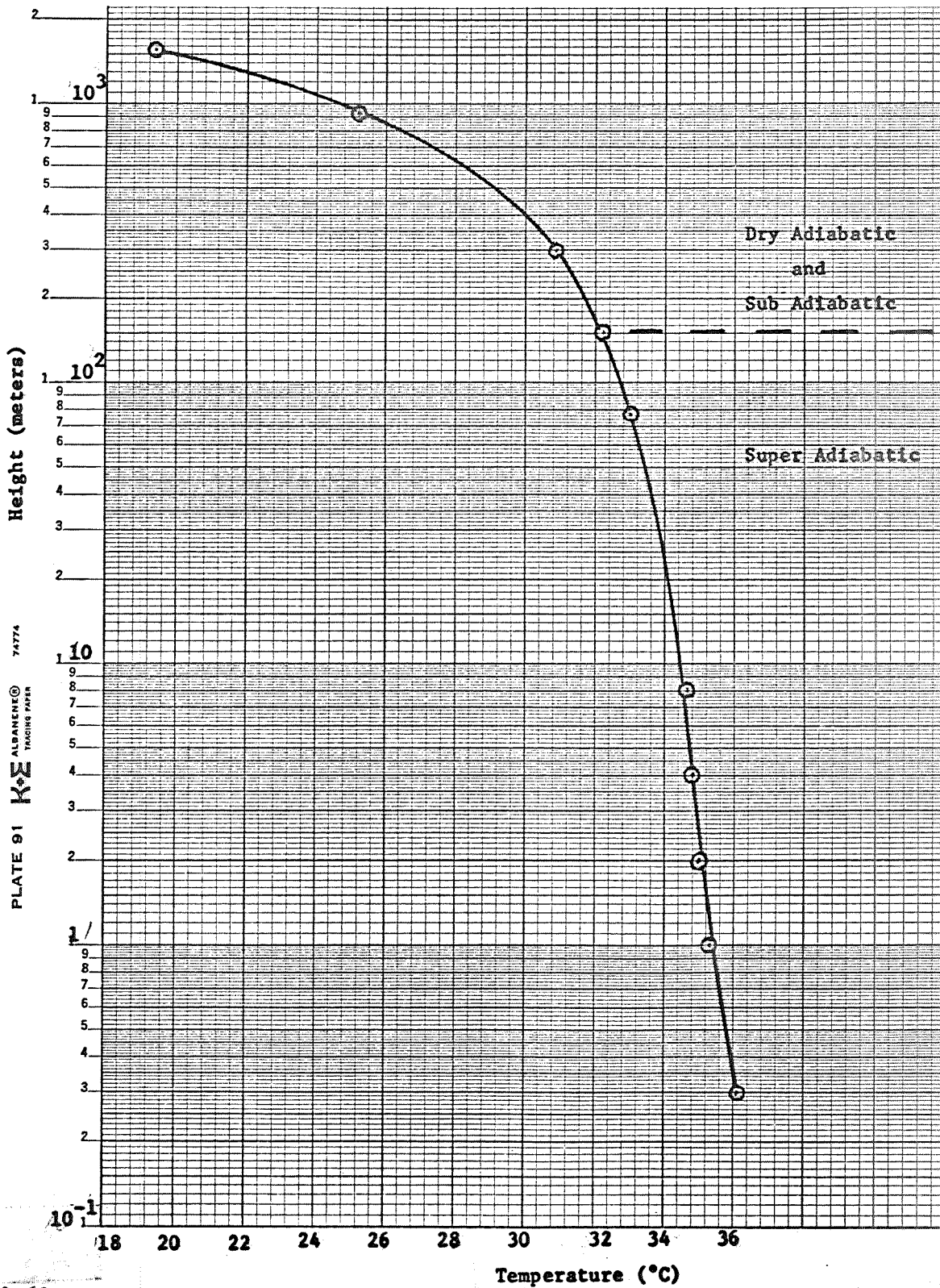
8-28-68

1545 PDT



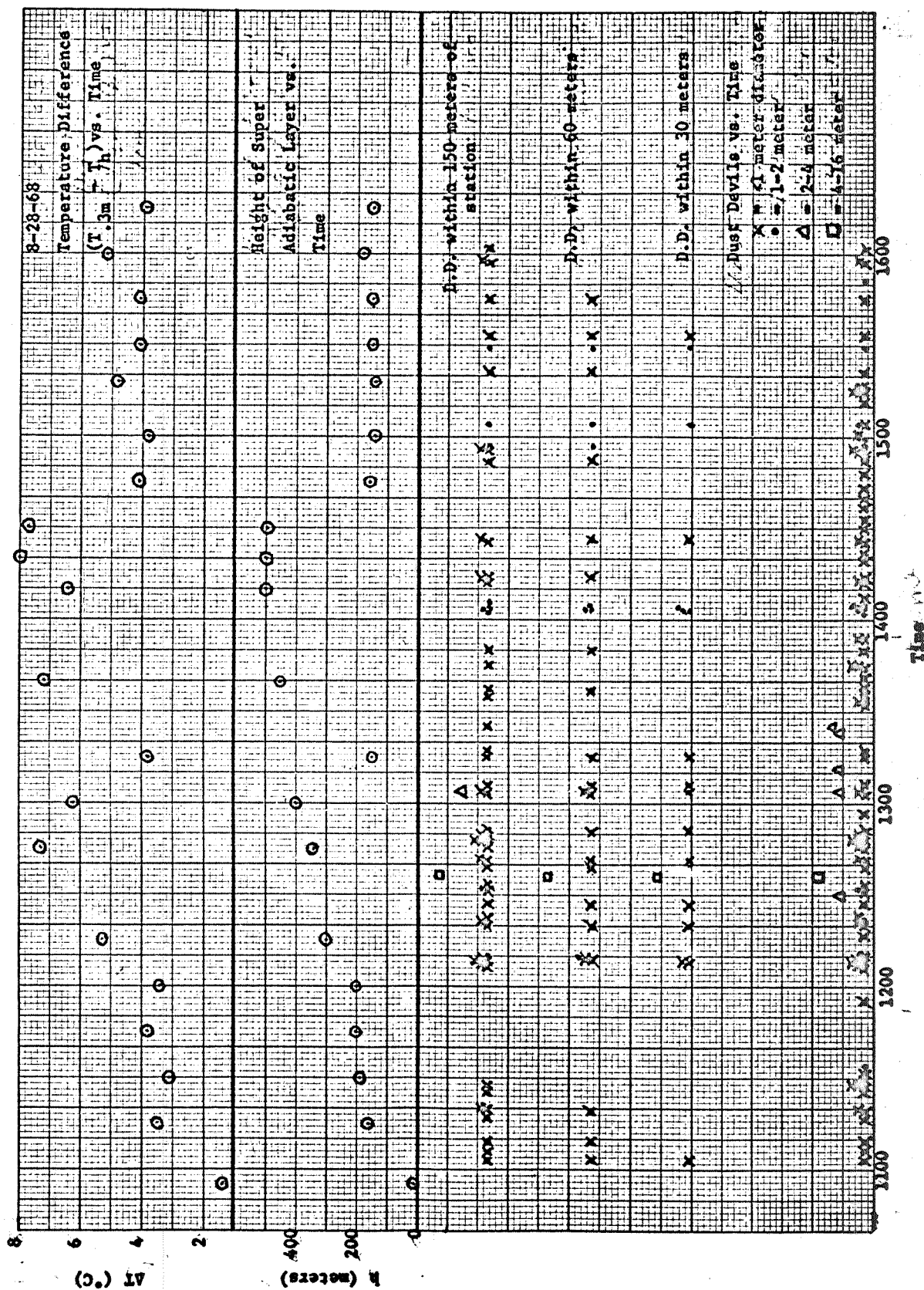
8-28-68

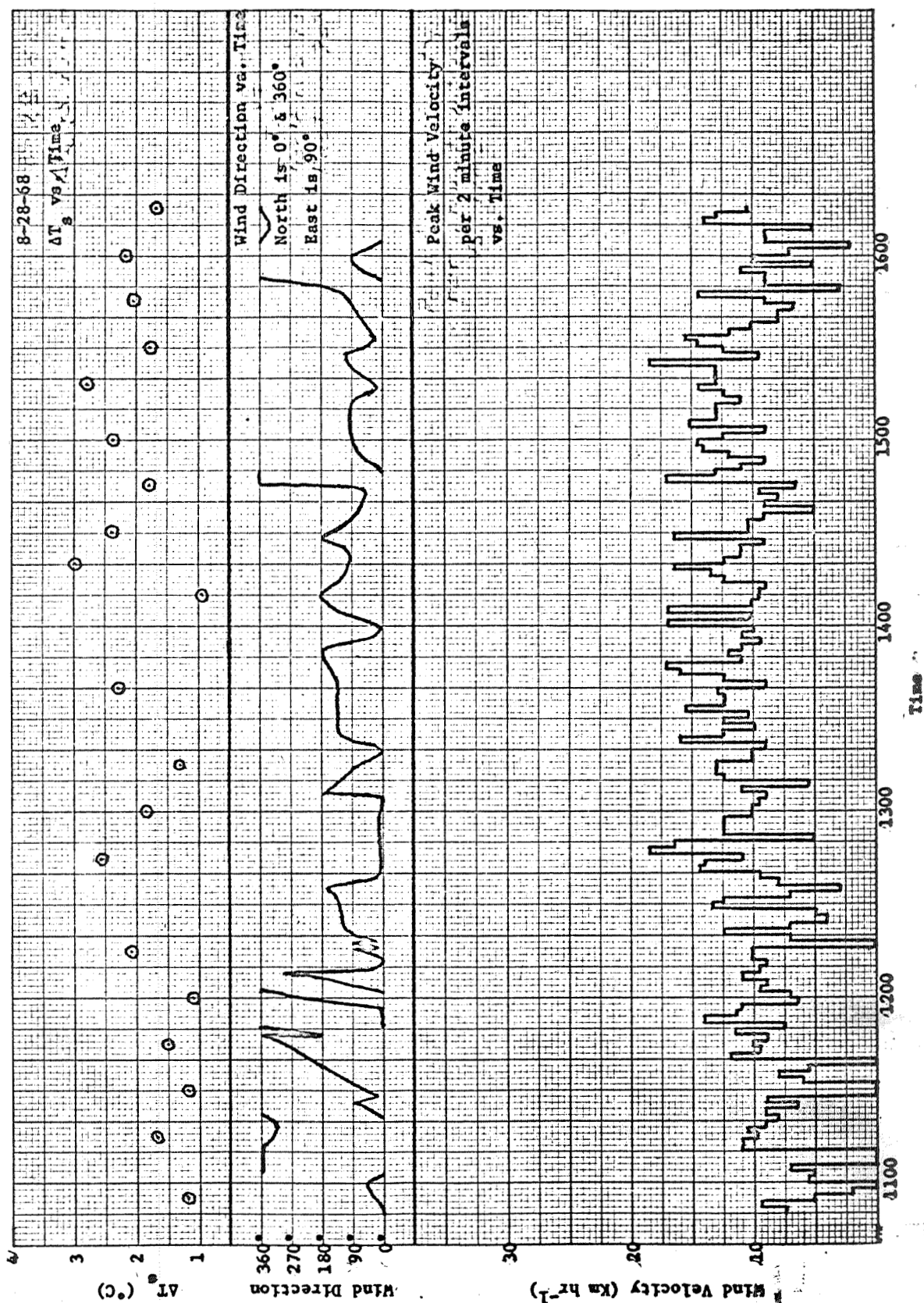
1600 PDT

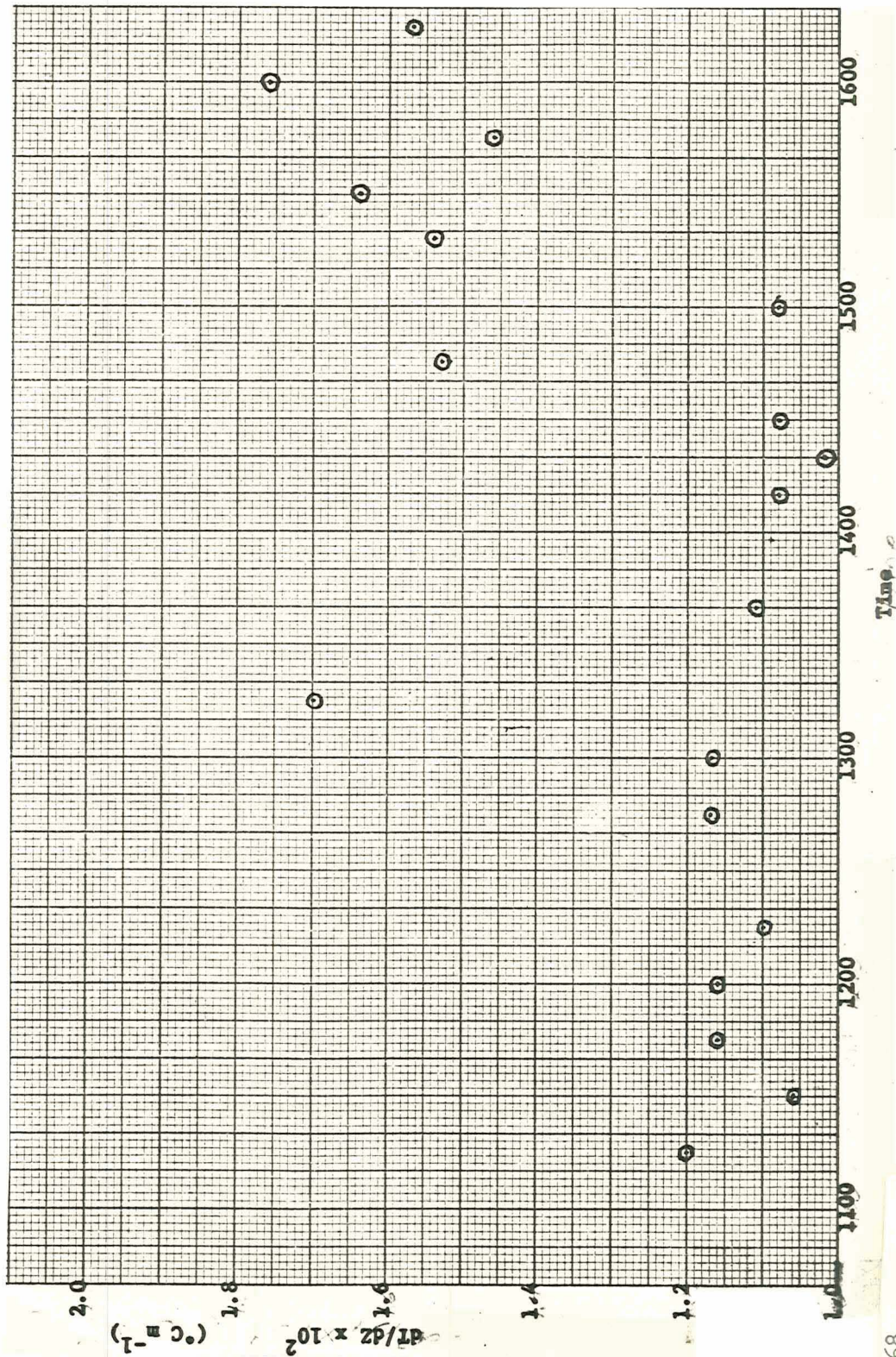


8-28-68

1615 PDT



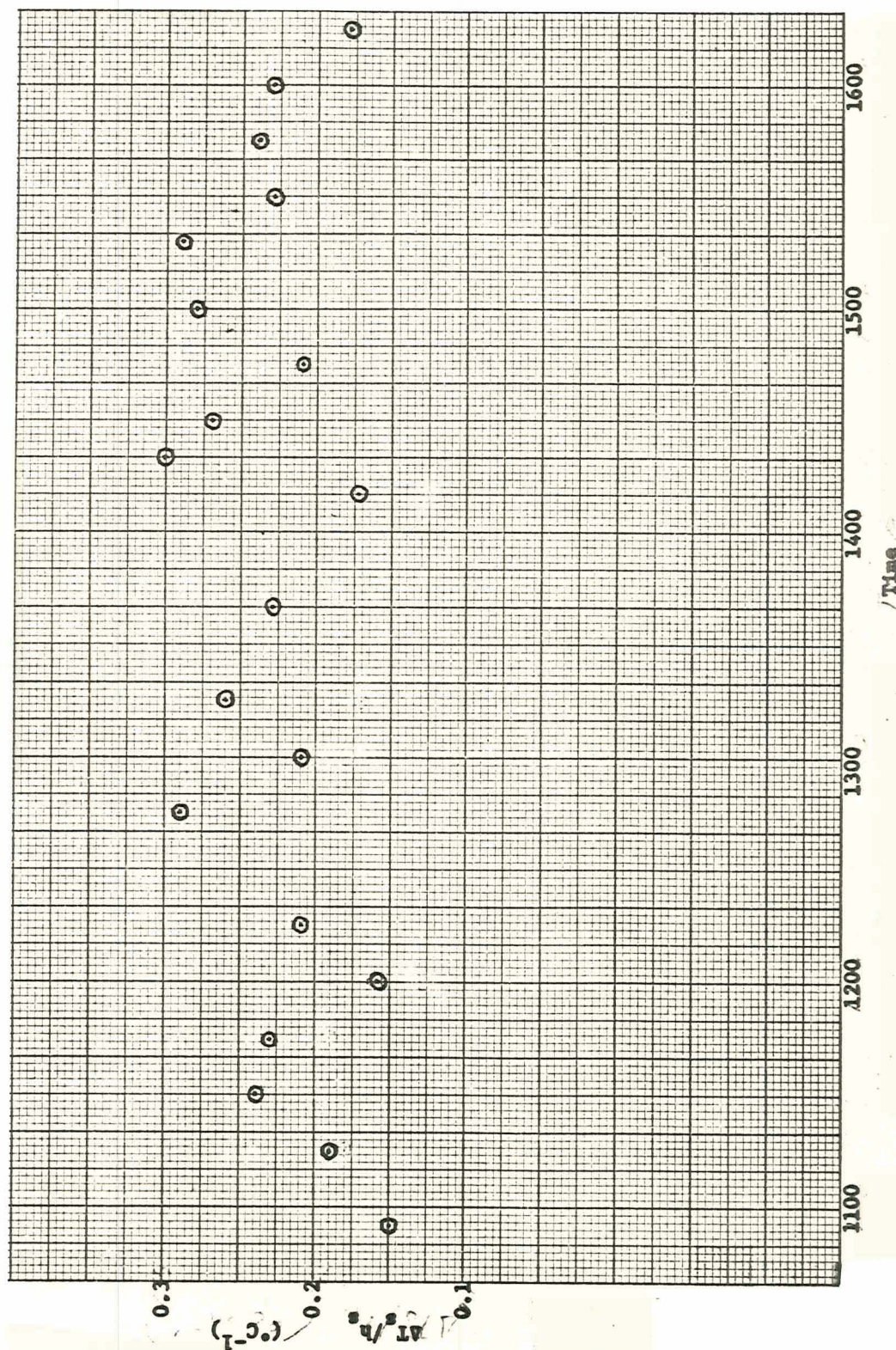




8-28-68

Lapse Rate (dT/dz)

vs. Time

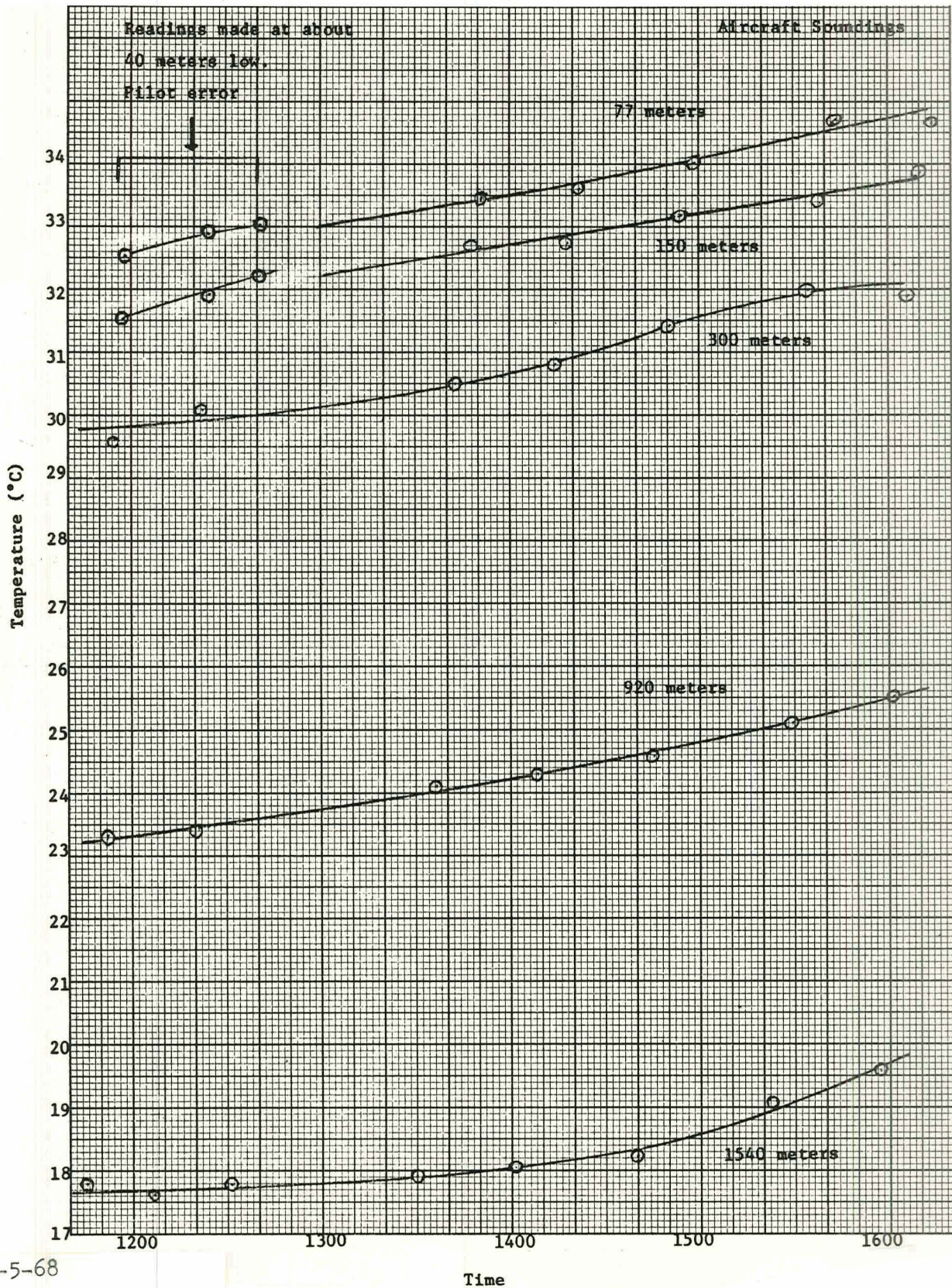


8-28-68

$\Delta T_s / h_s$ vs. Time

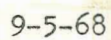
DATA FOR 9-5-68

30-692-6 (8-68)

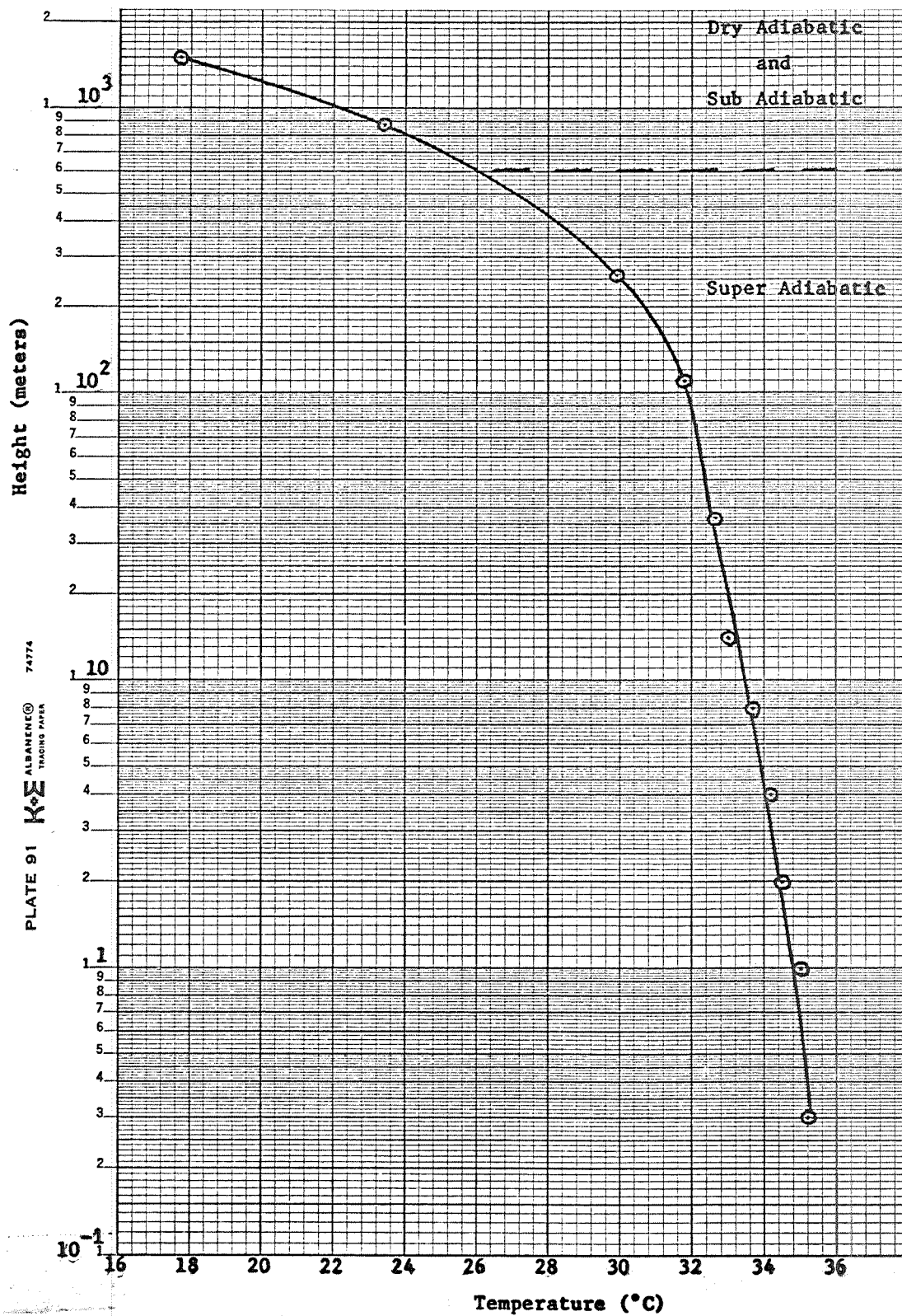


9-5-68

Aircraft Soundings

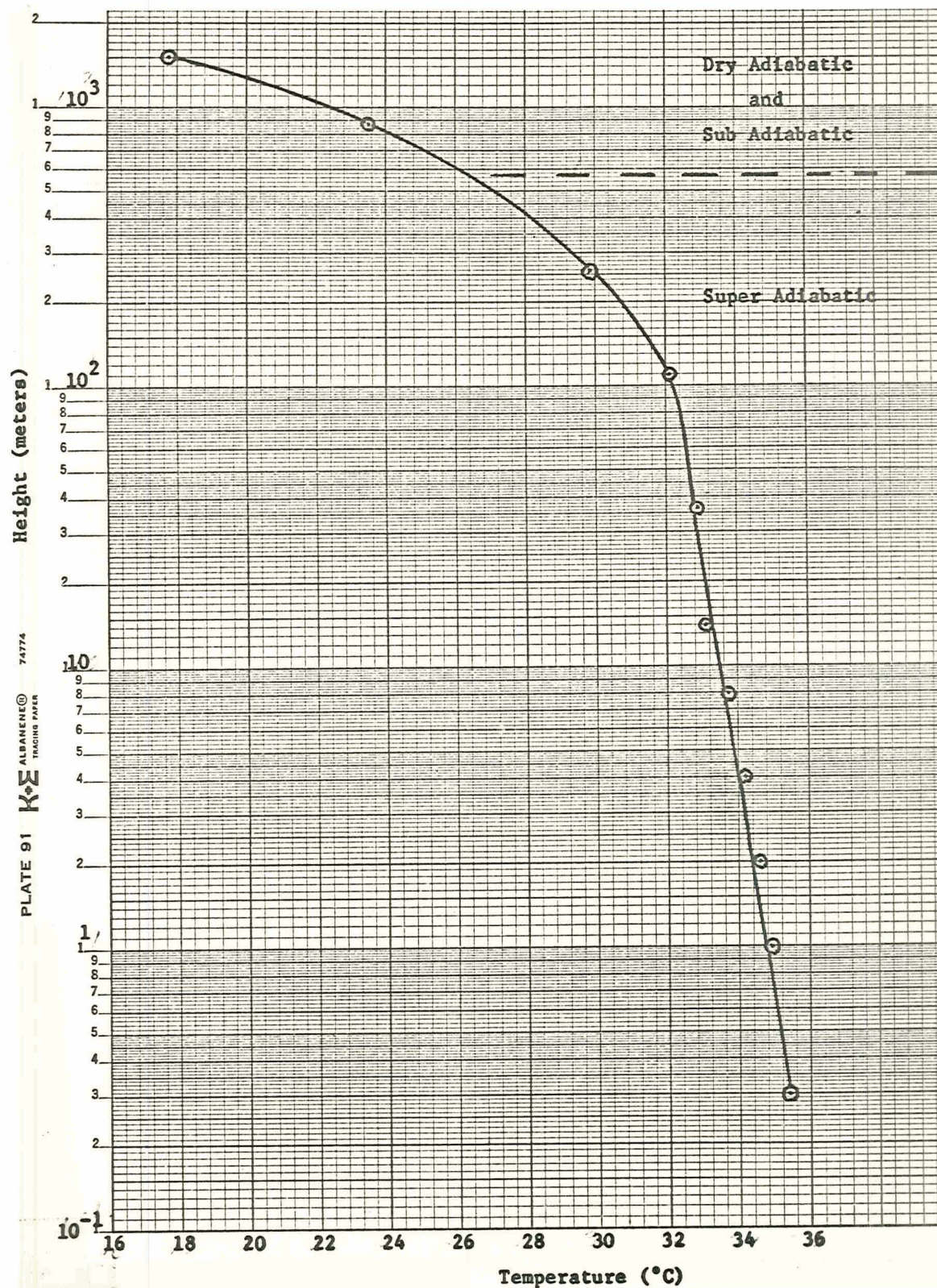


192



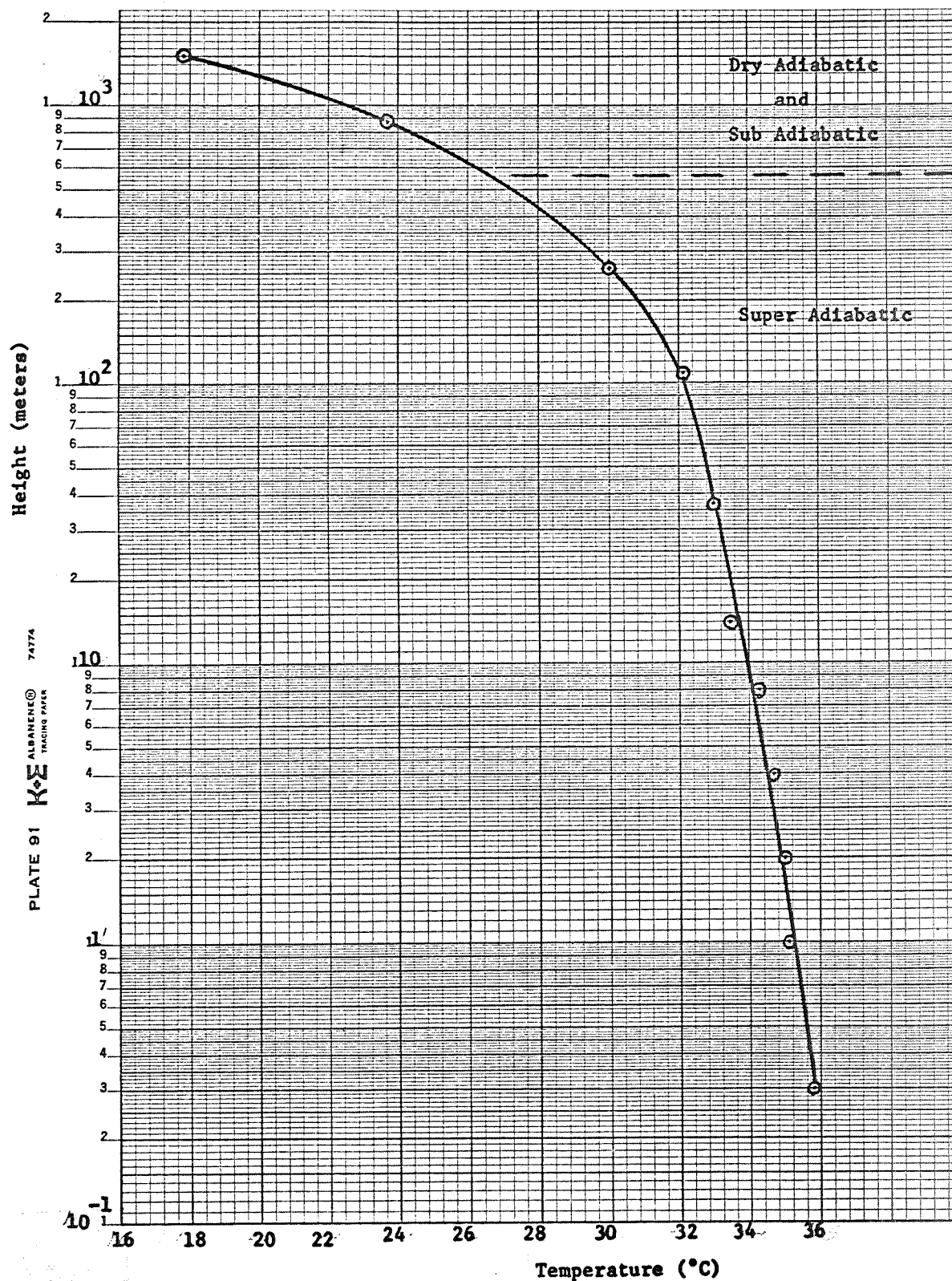
9-5-68

1215 PDT



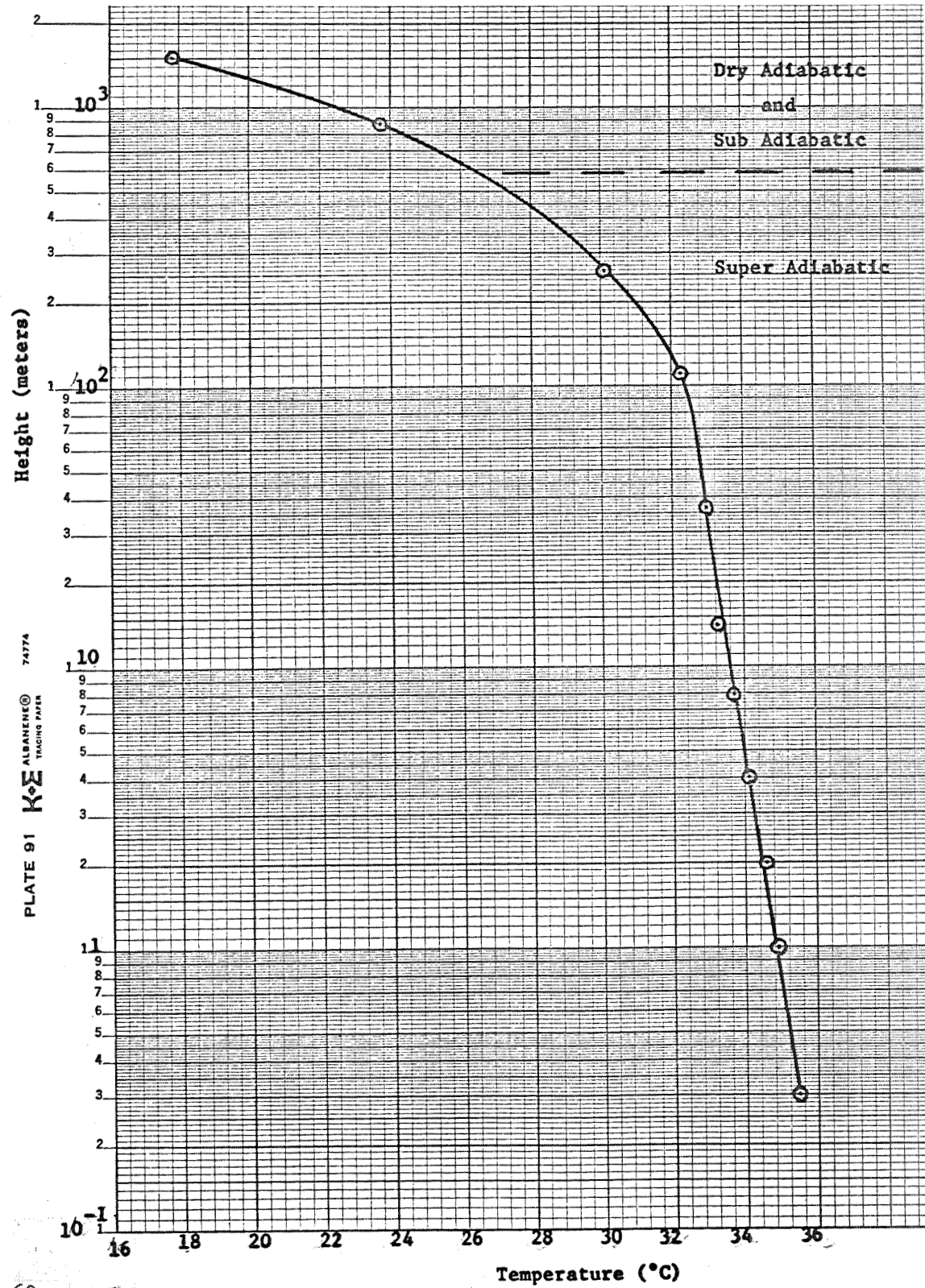
9-5-68

1230 PDT



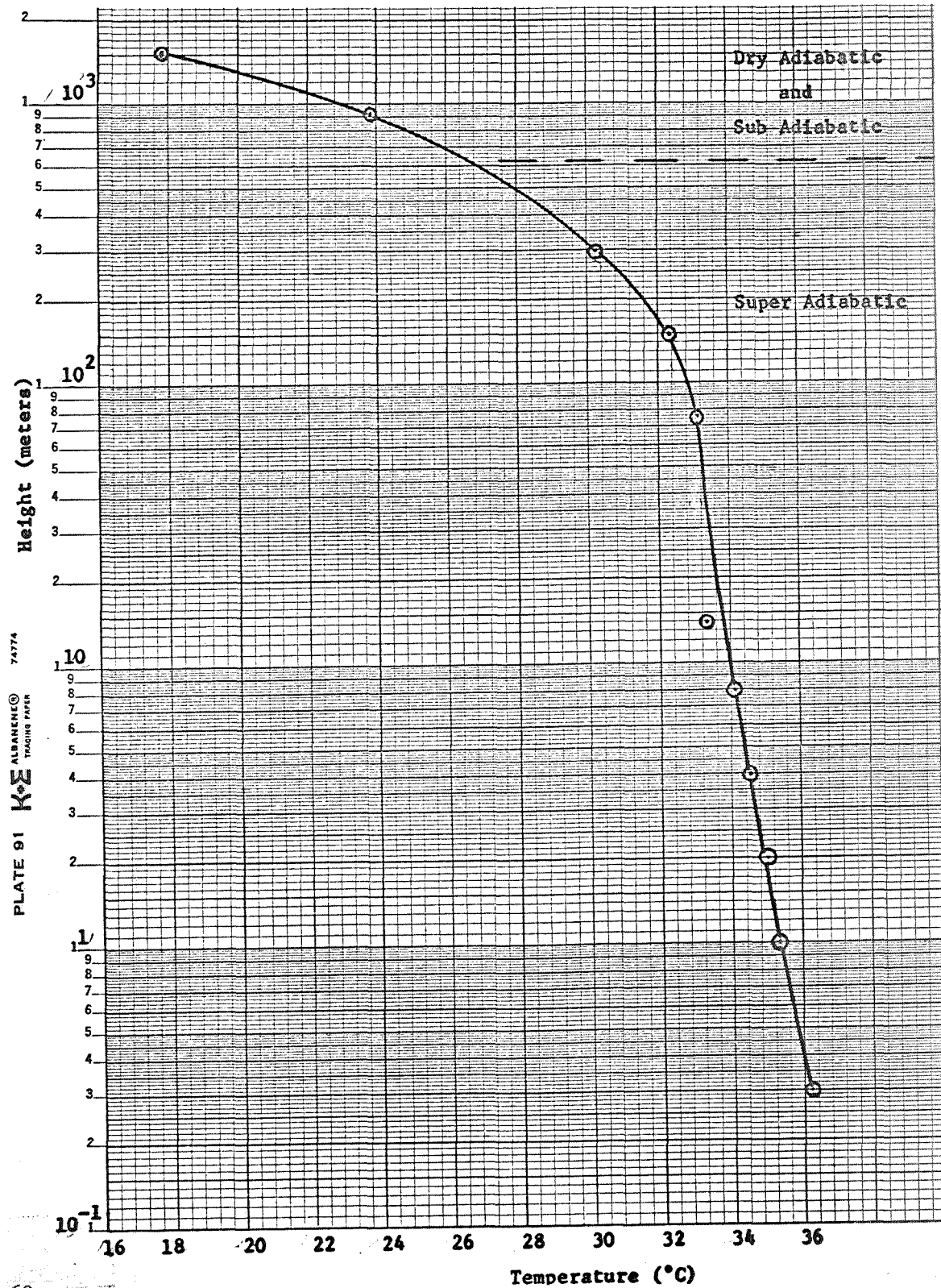
9-5-68

1245 PDT



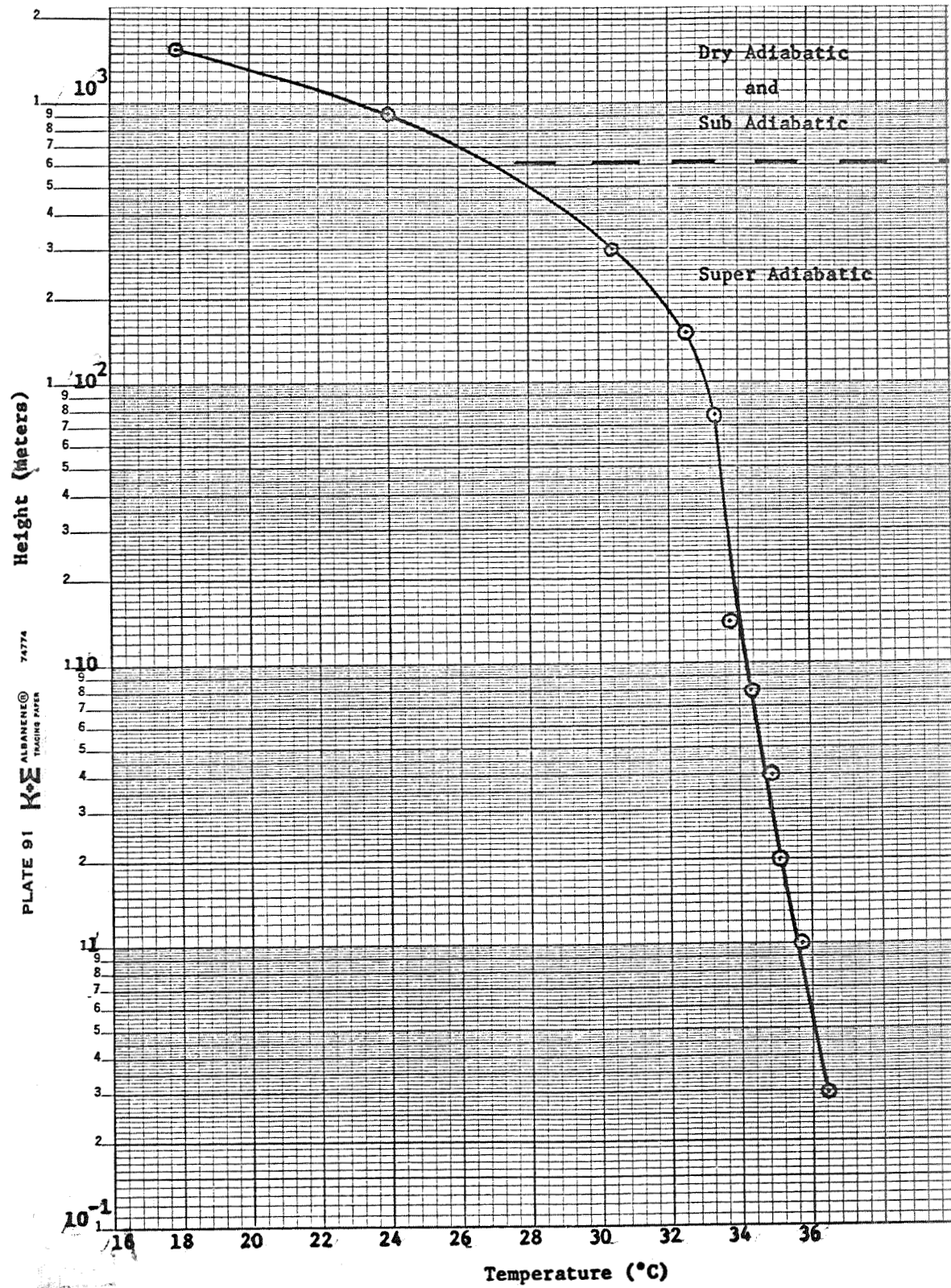
9-5-68

1300 PDT



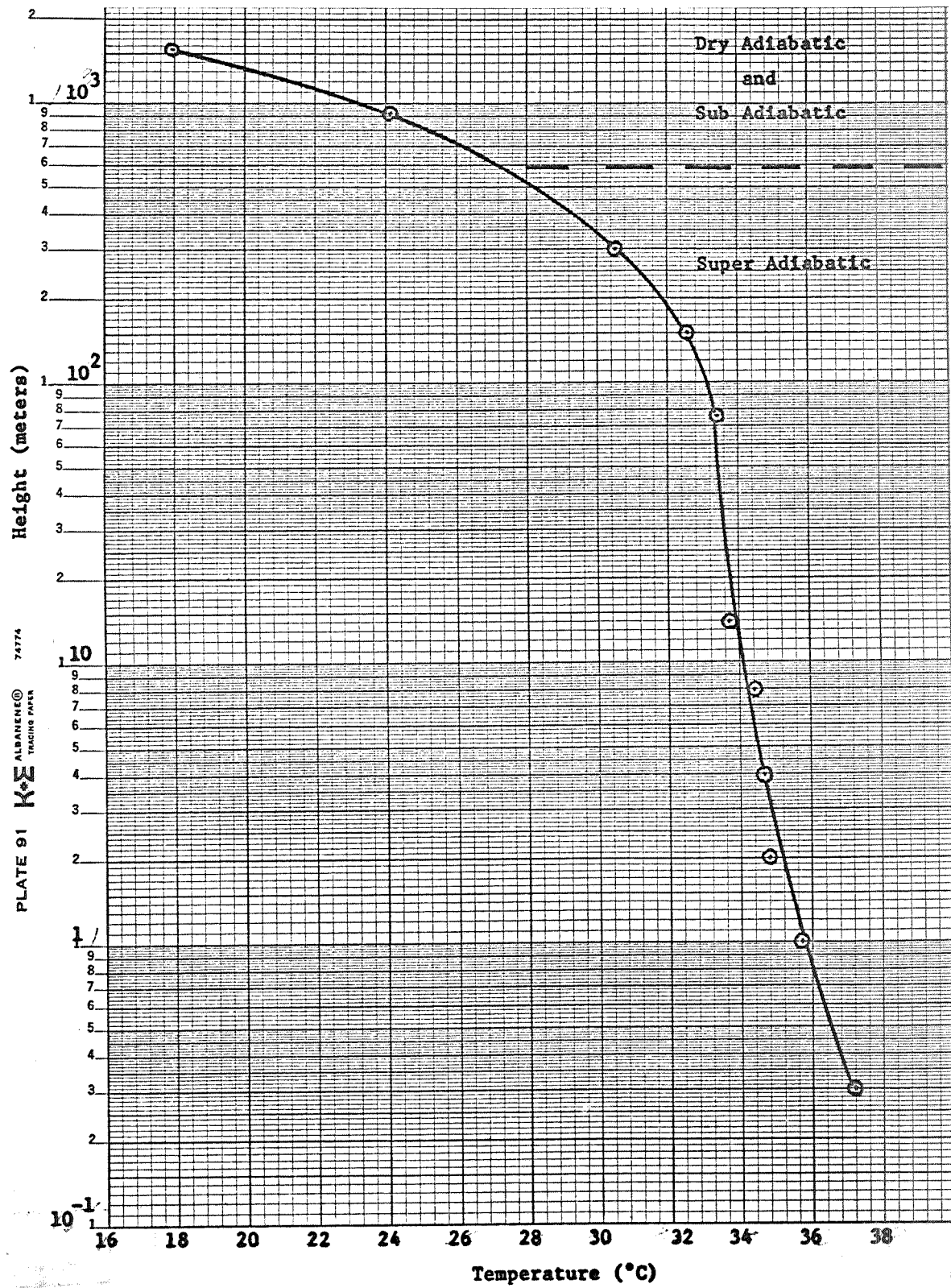
9-5-68

1315 PDT



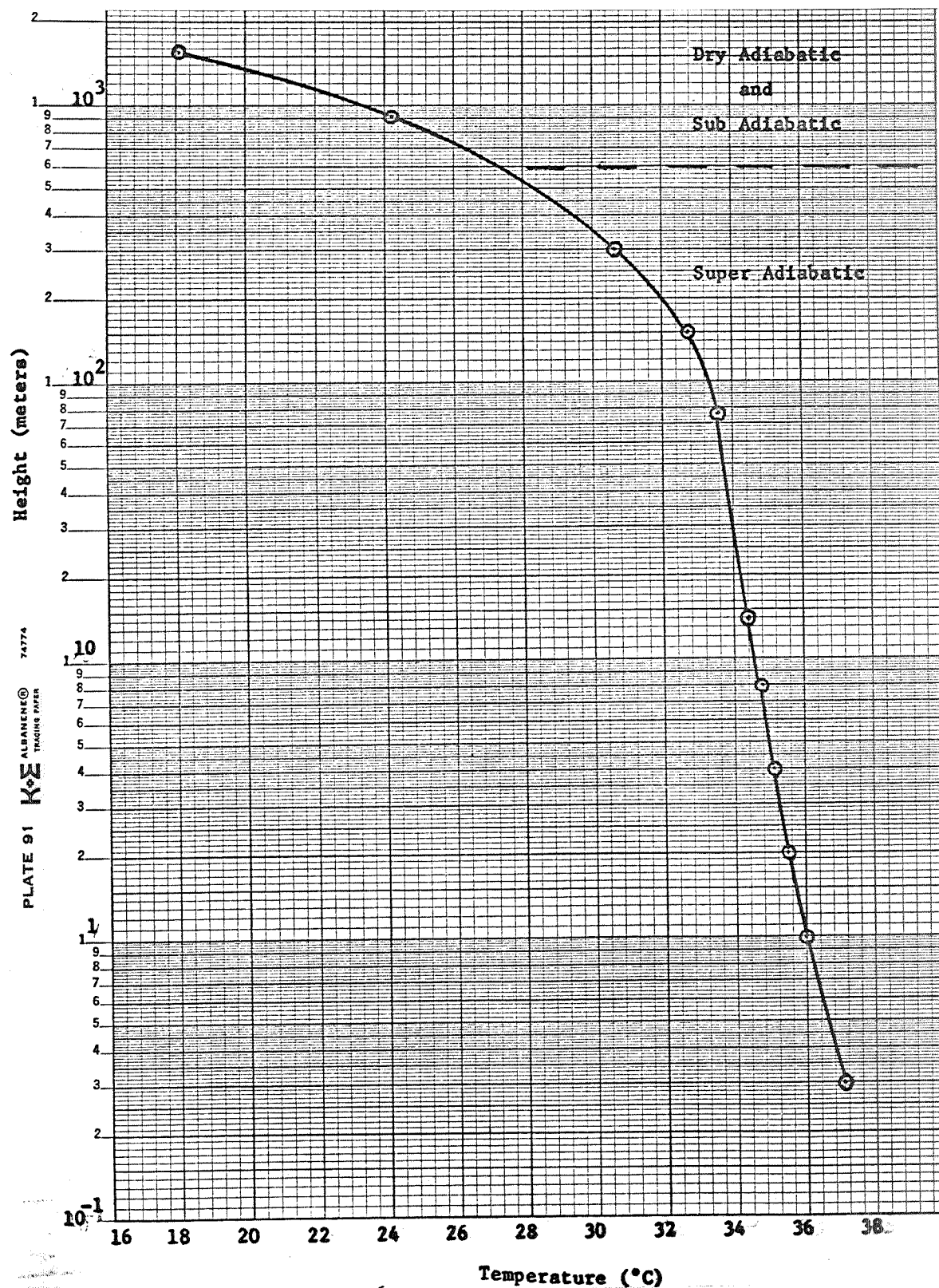
9-5-68

1330 PDT



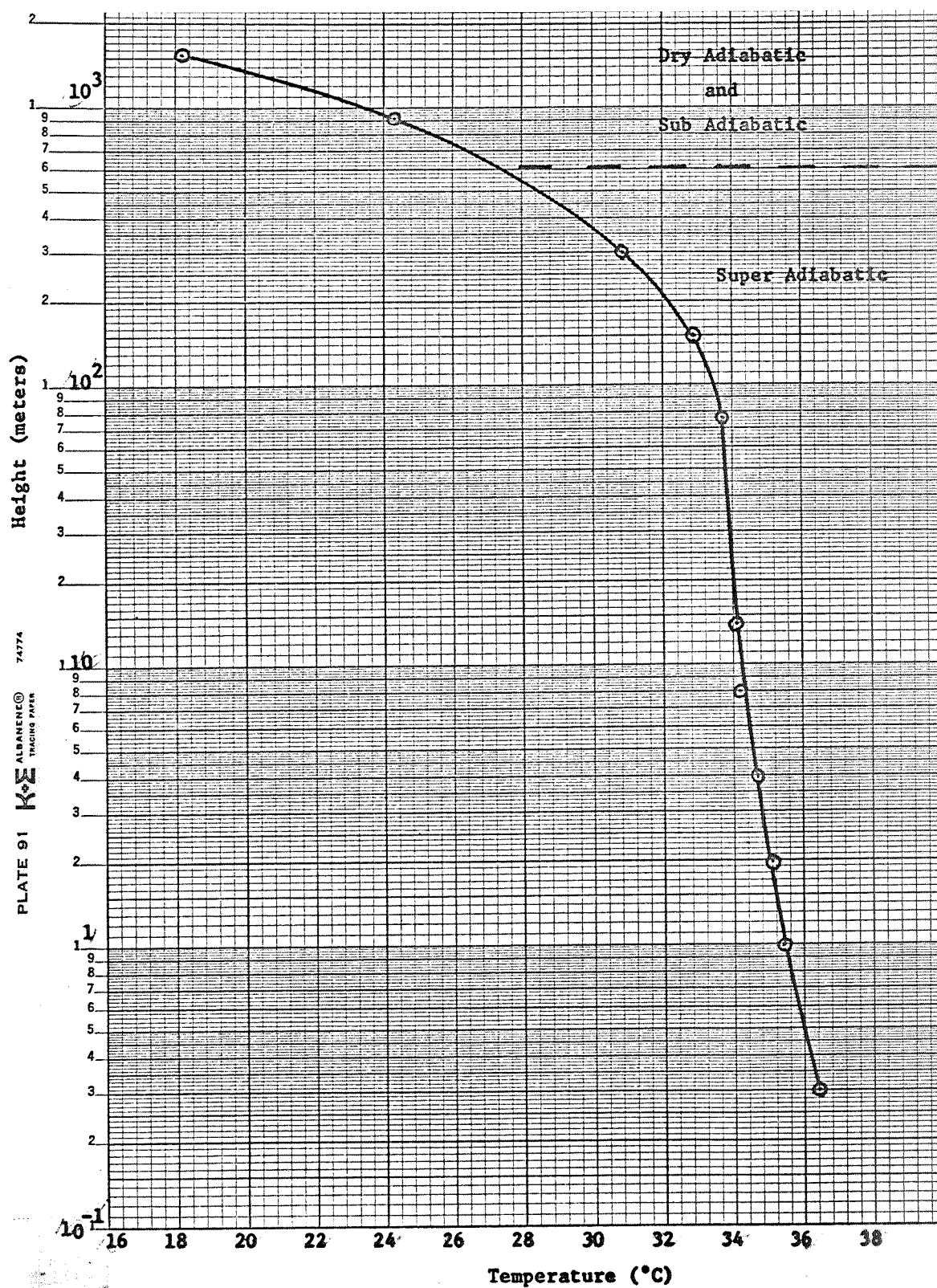
9-5-68

1345 PDT



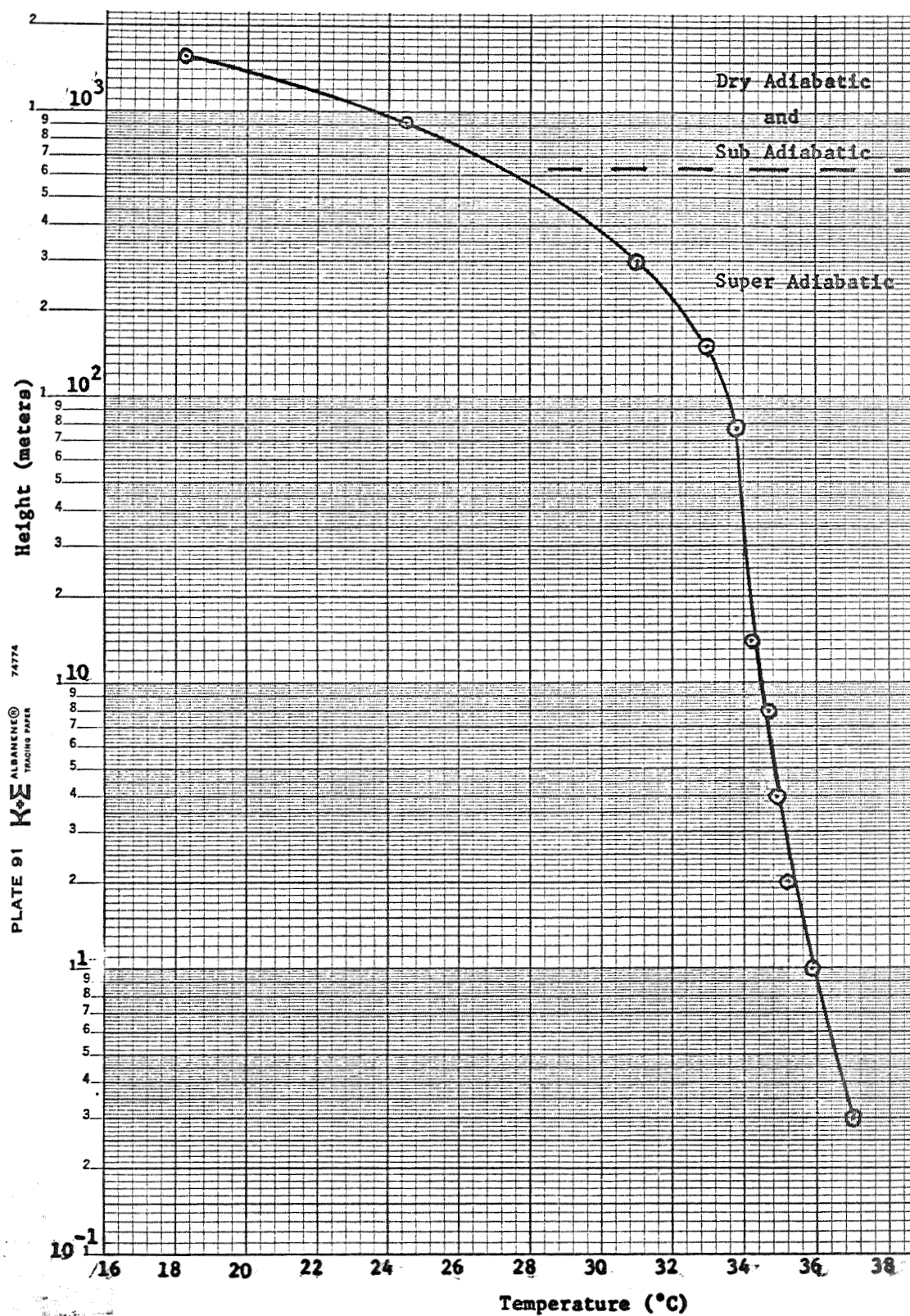
9-5-68

1400 PDT



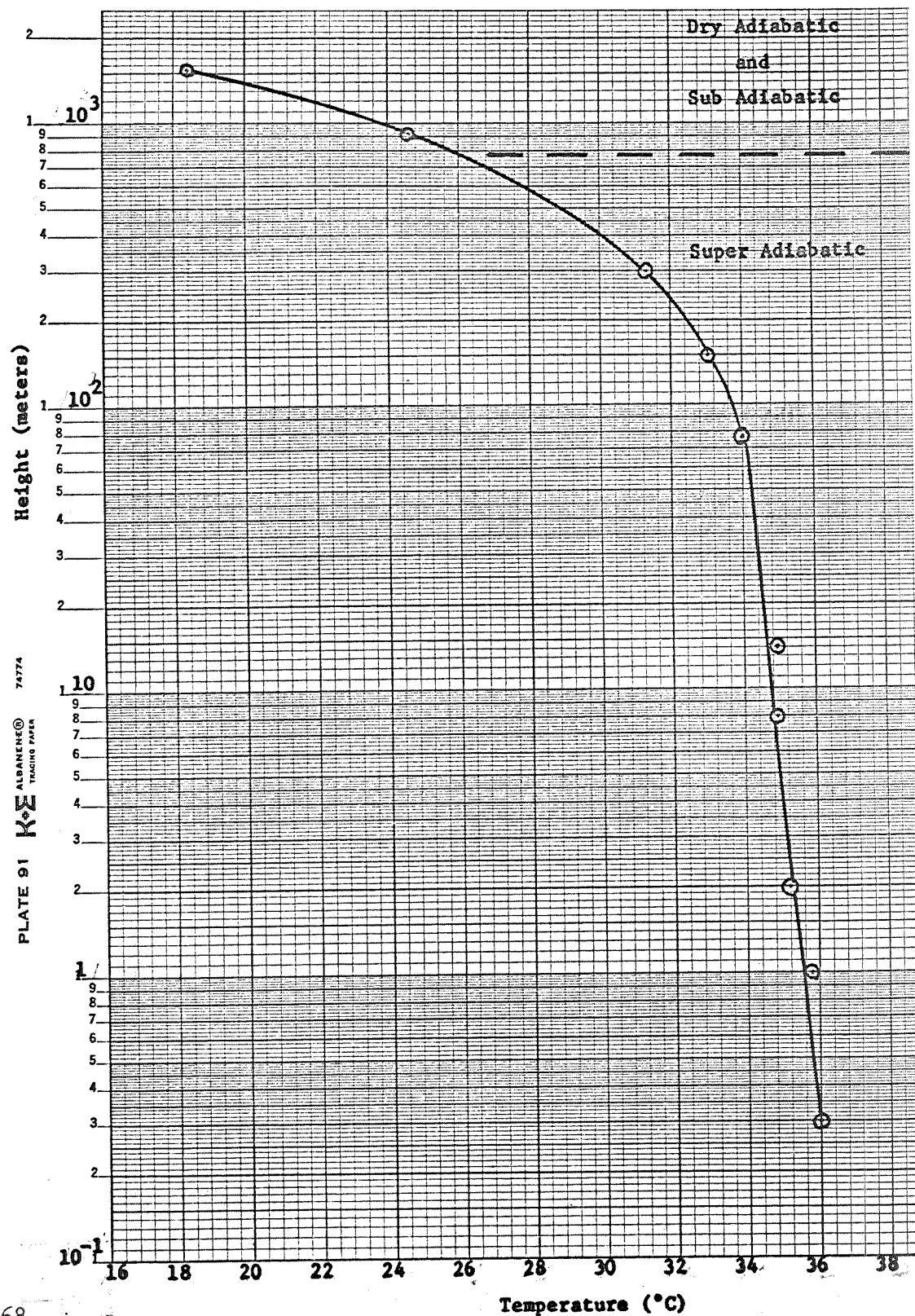
9-5-68

1415 PDT



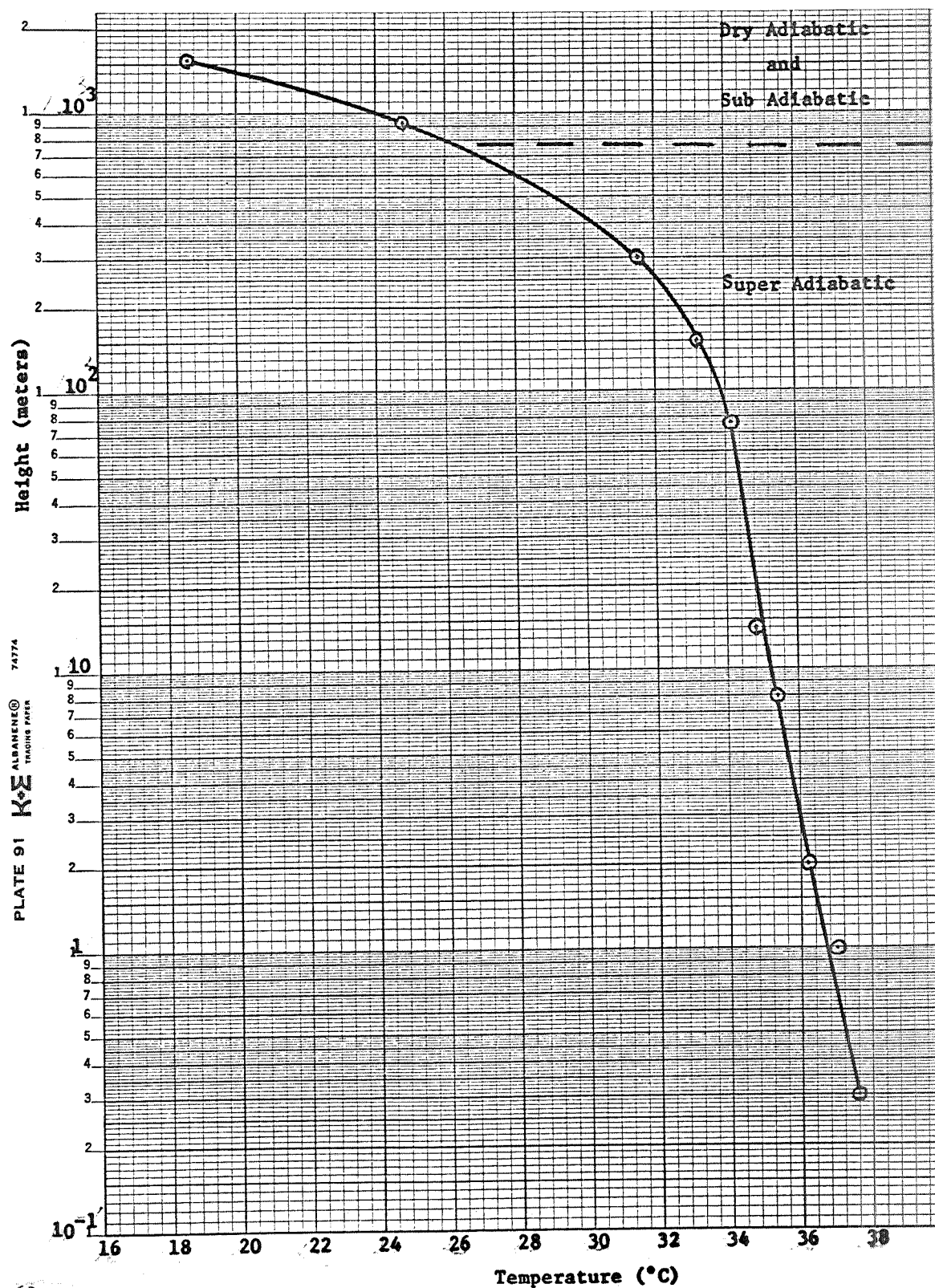
9-5-68

1430 PDT



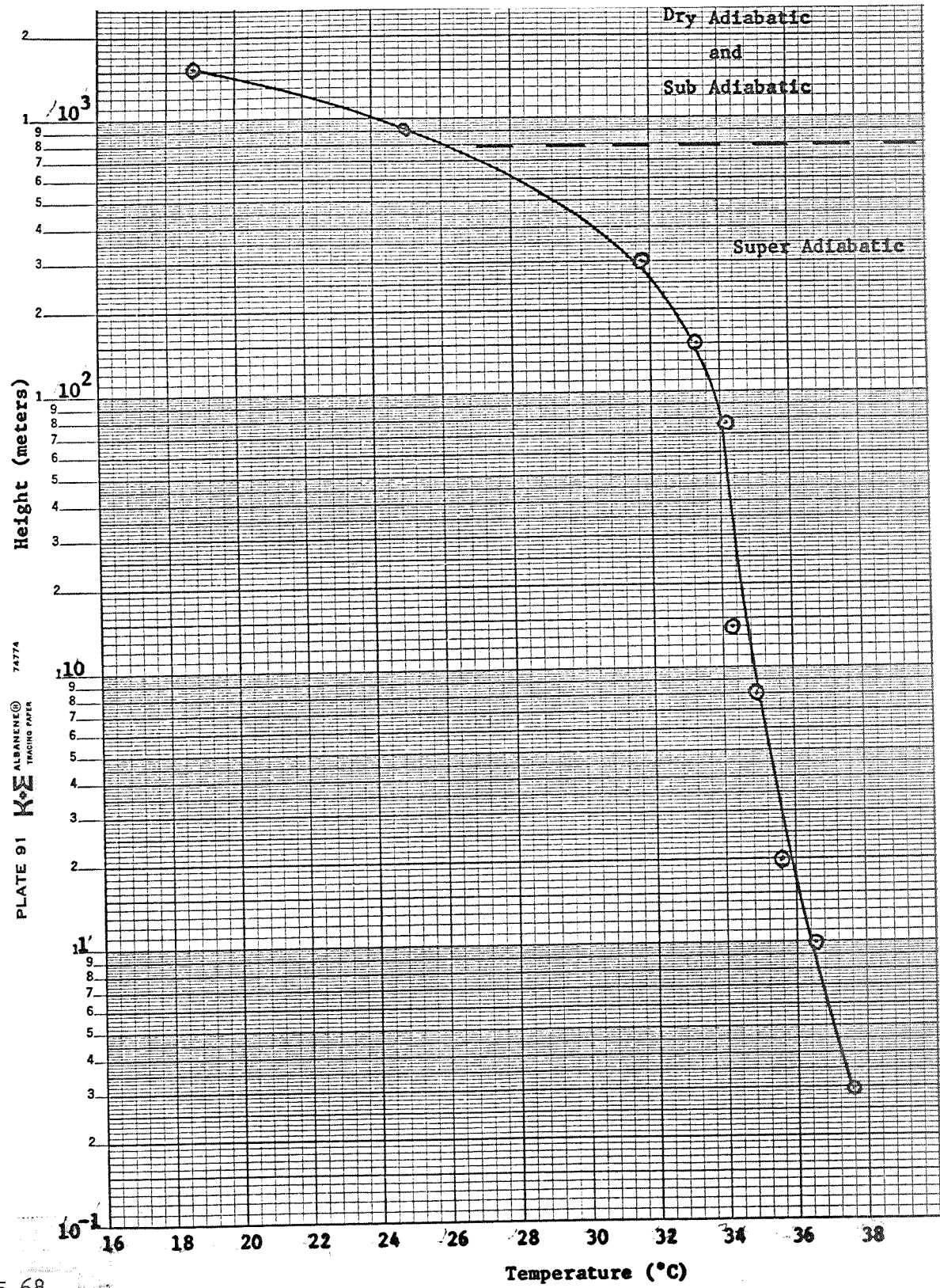
9-5-68

1445 PDT



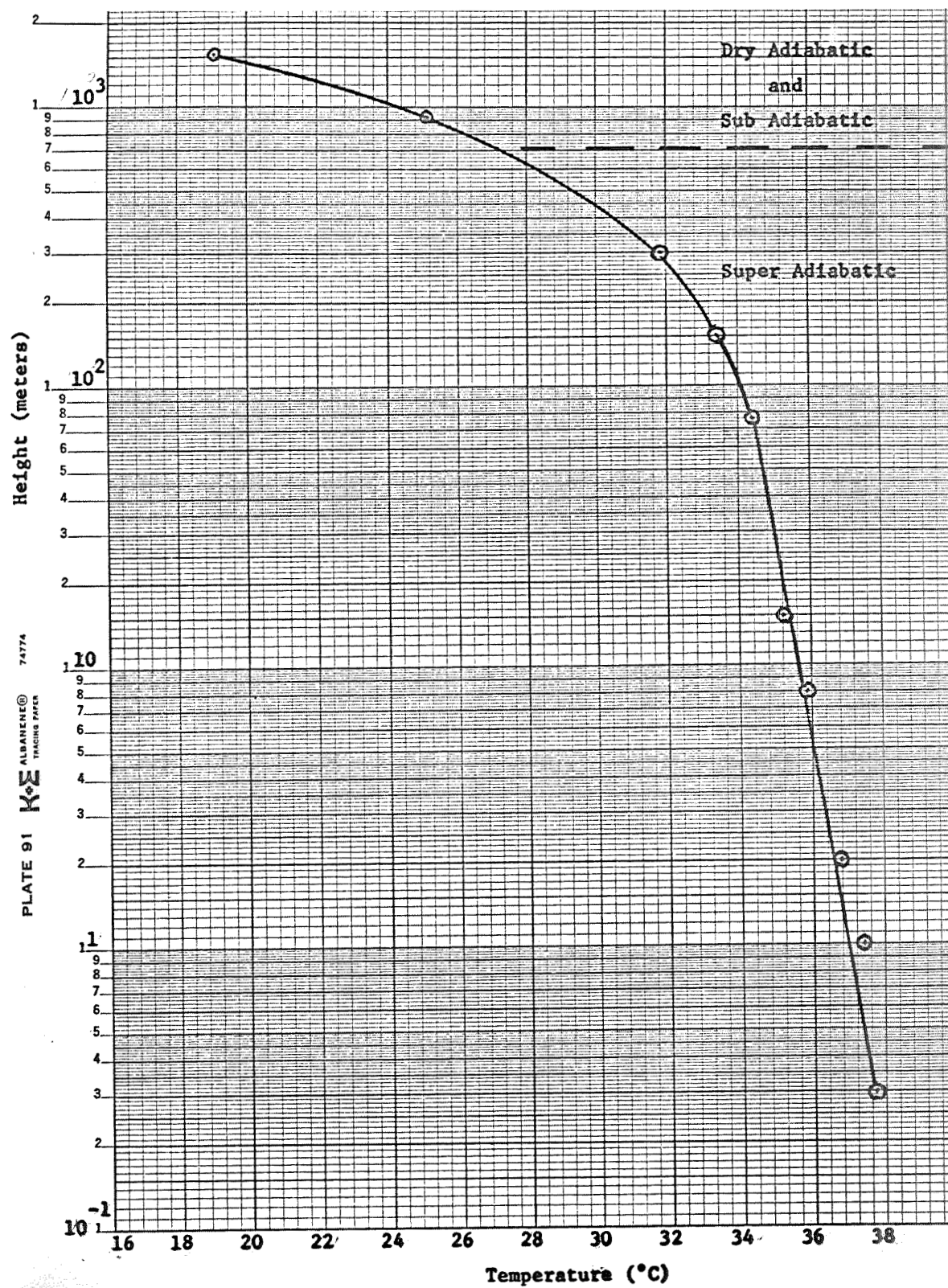
9-5-68

1500 PDT



9-5-68

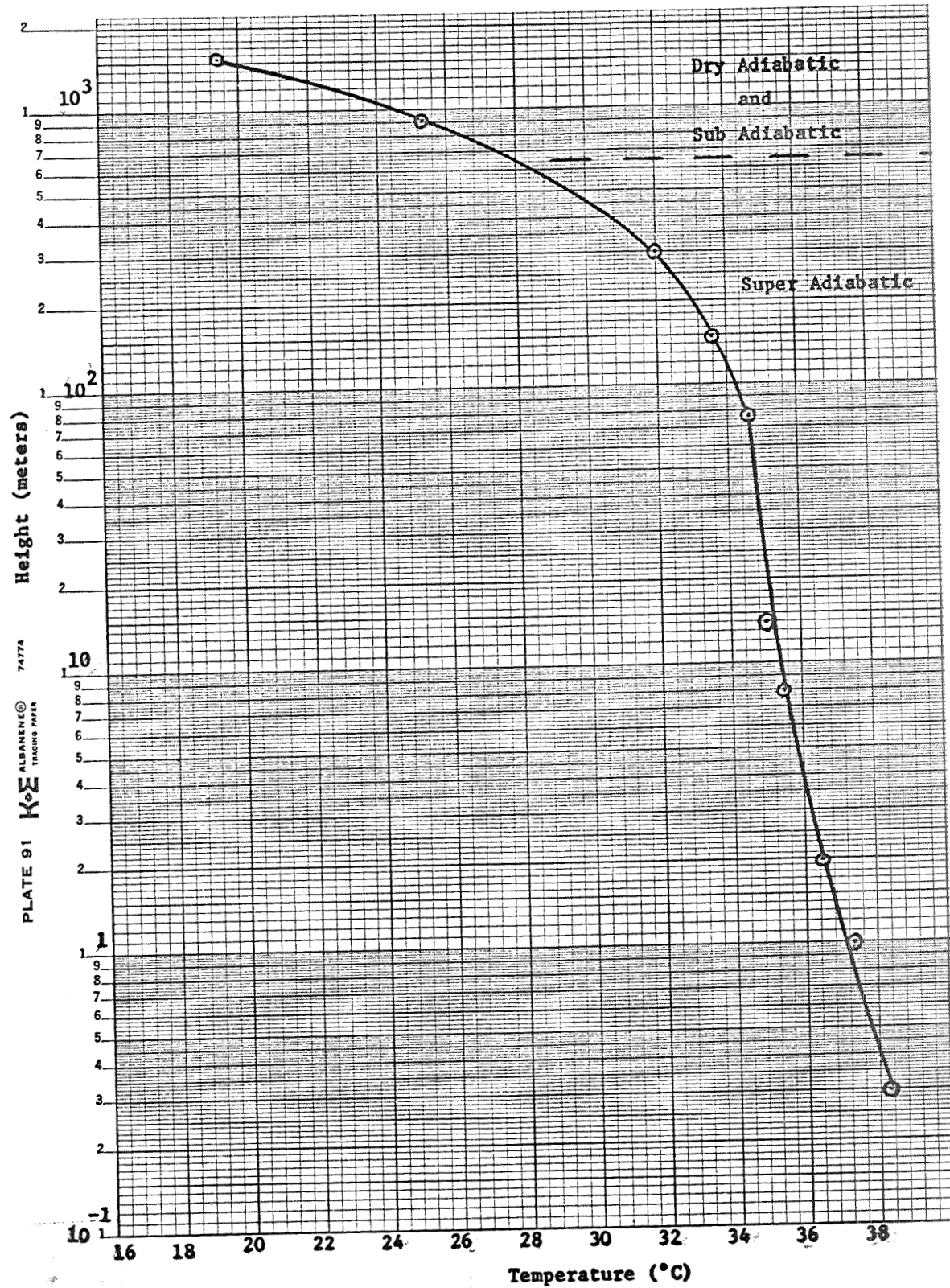
1515 PDT



9-5-68

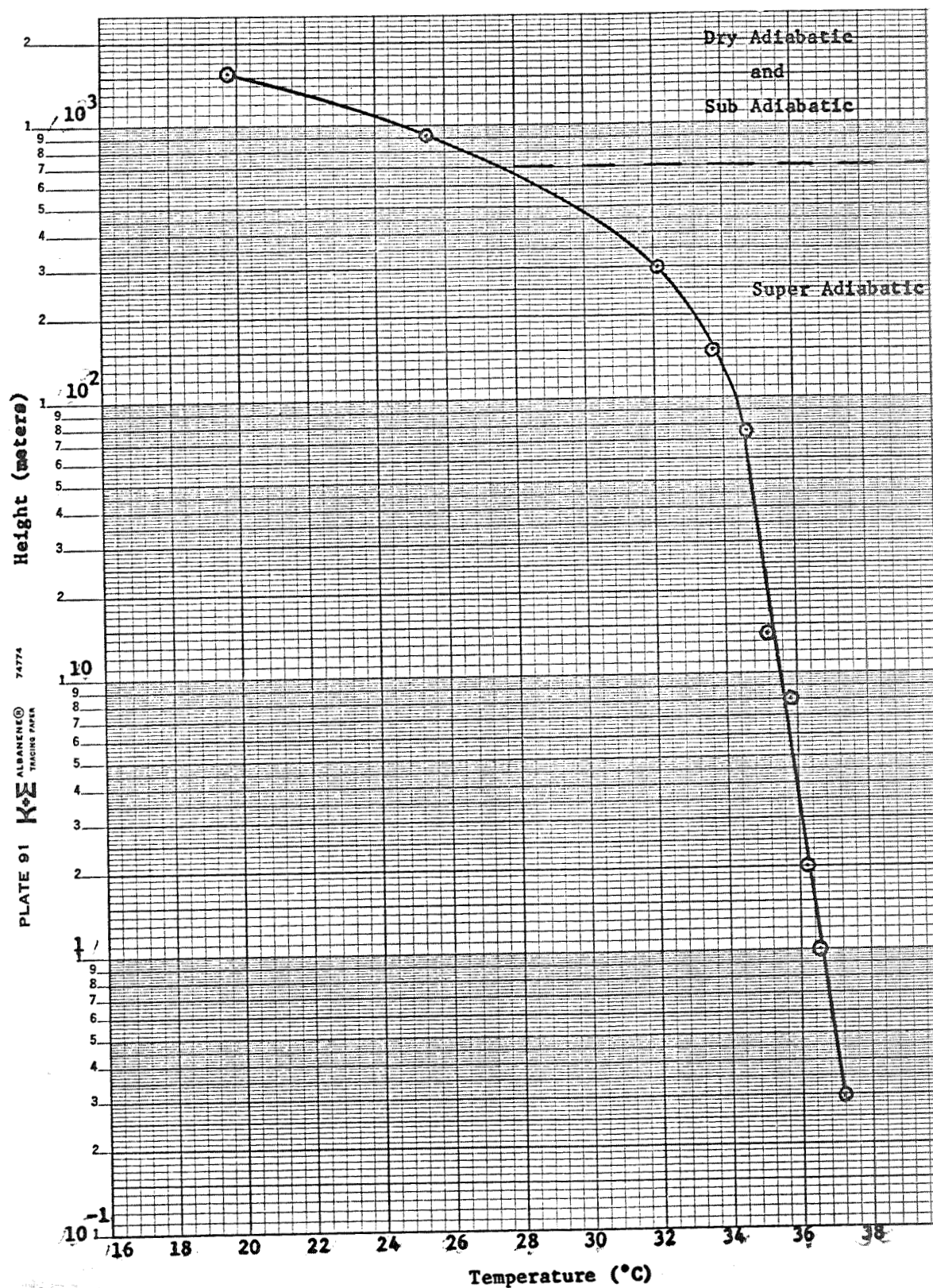
1530 PDT

FORM 30-692-6 (8-68)



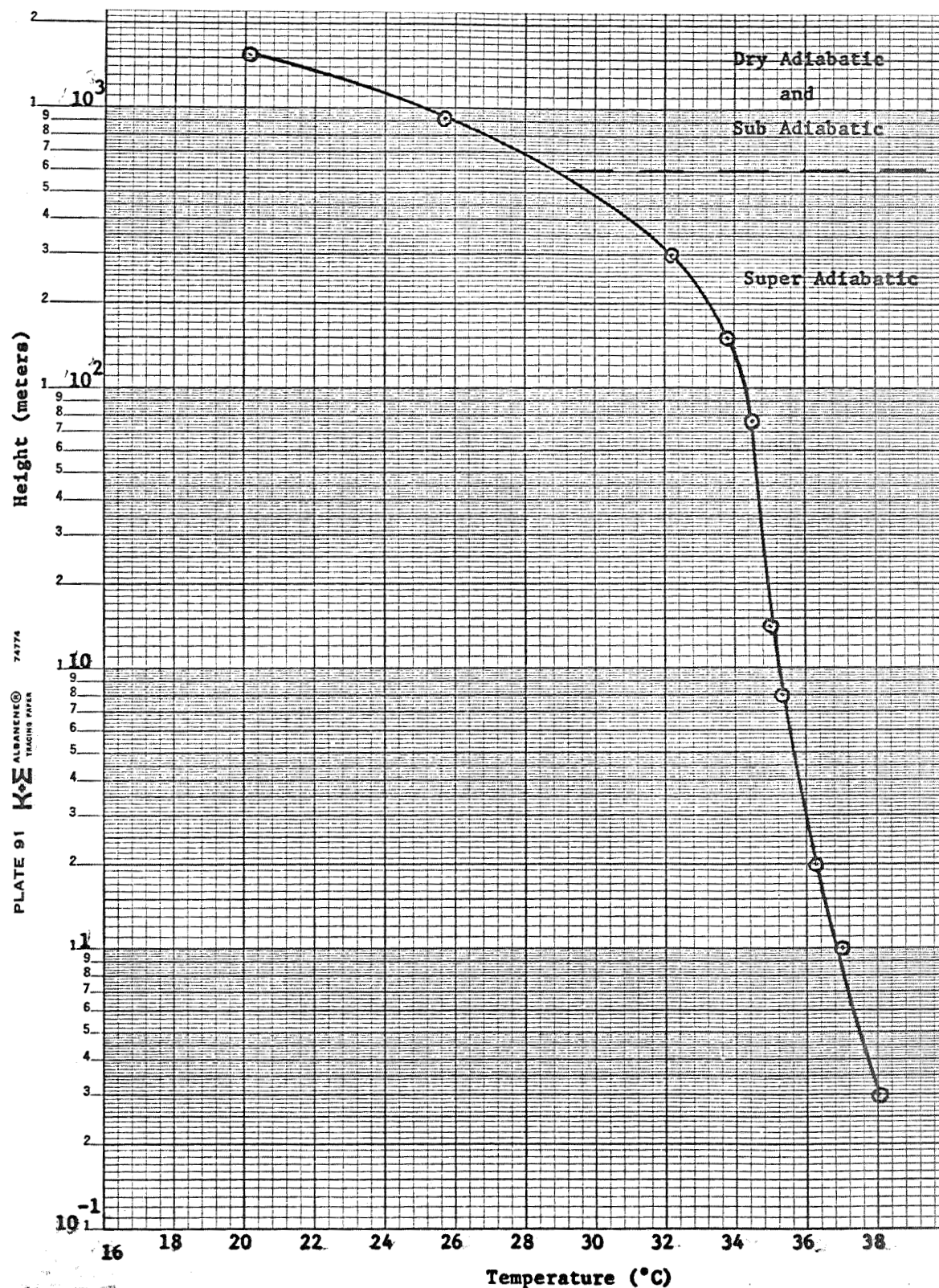
9-5-68

1545 PDT



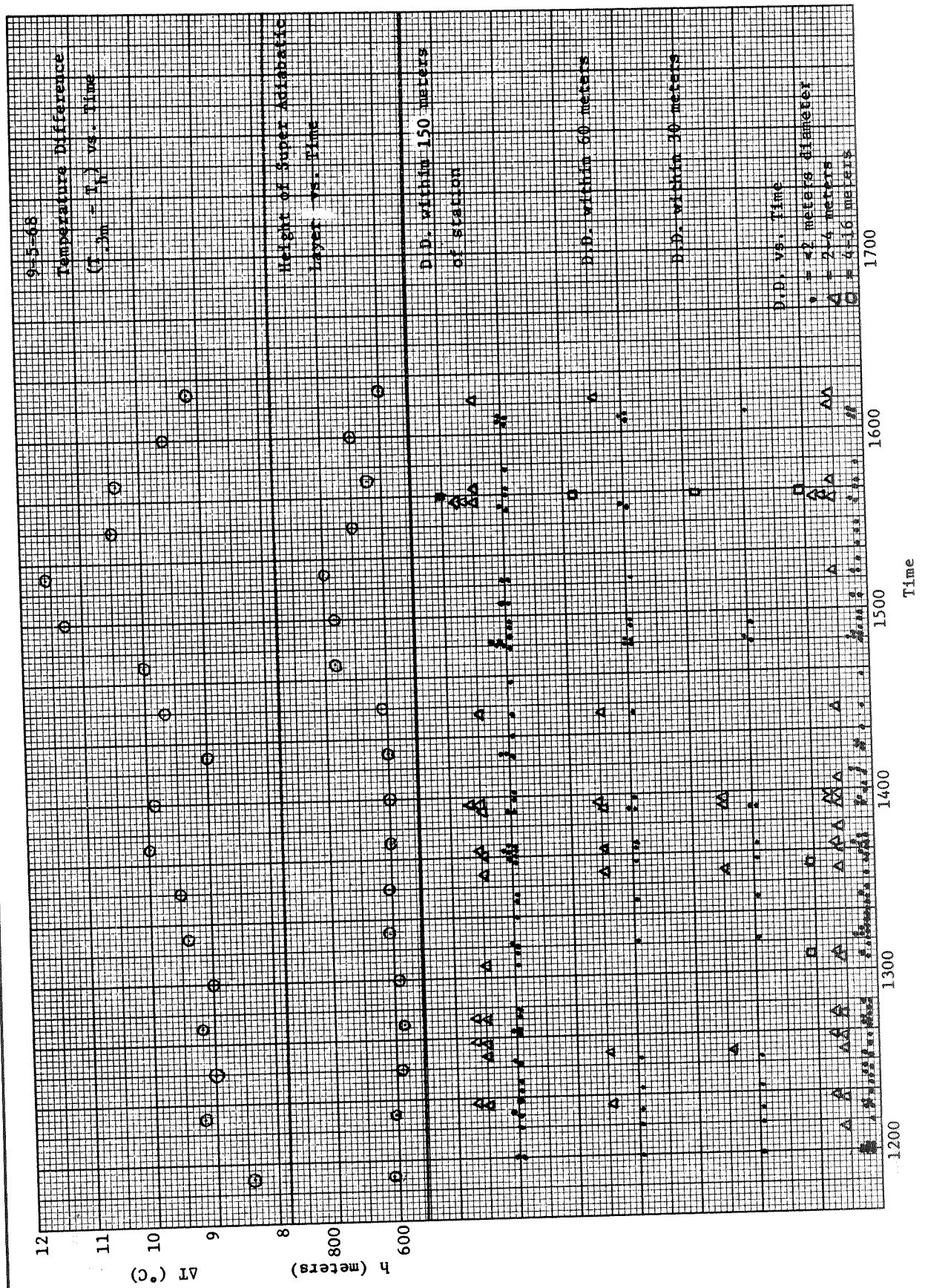
9-5-68

1600 PDT

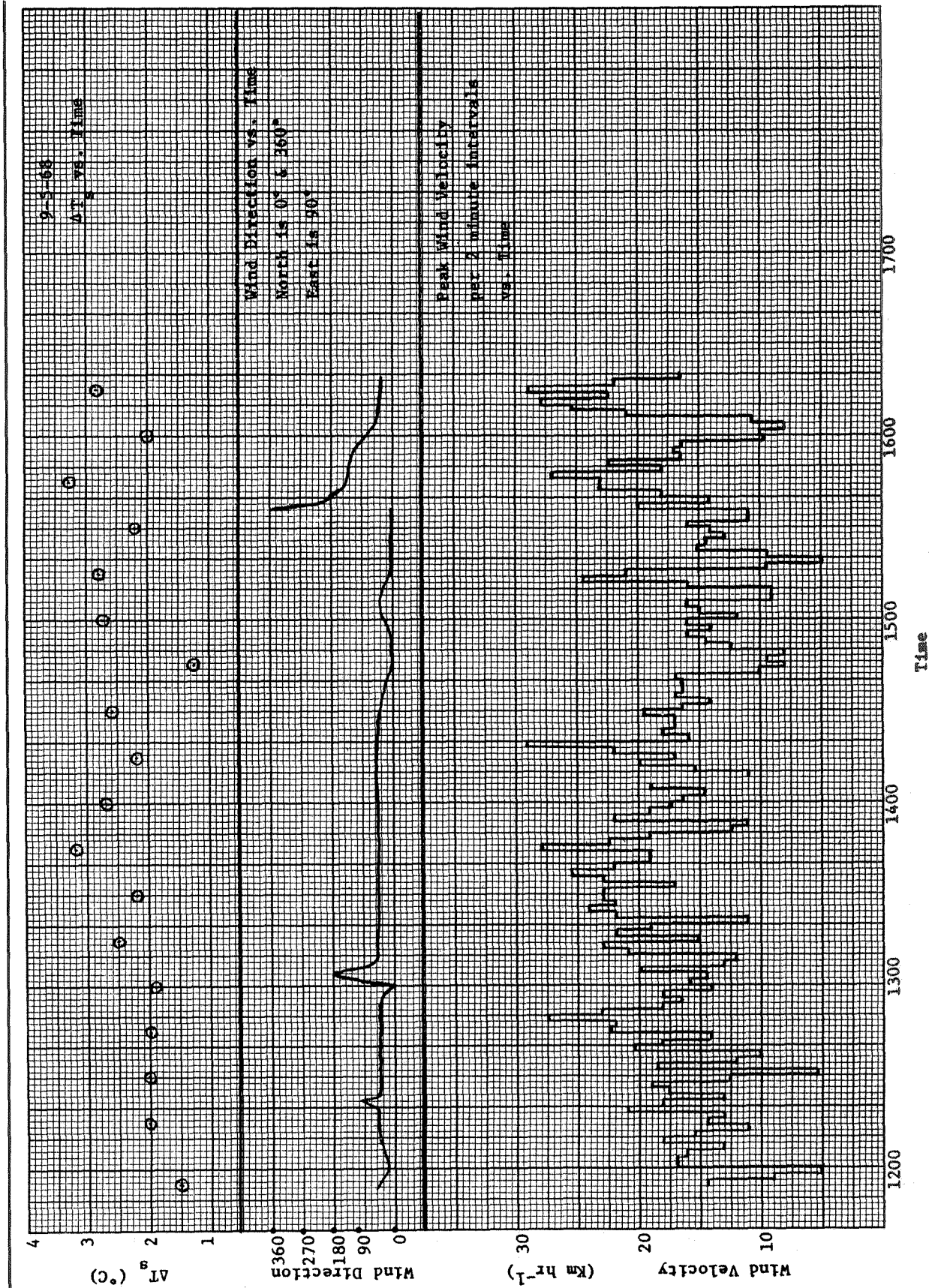


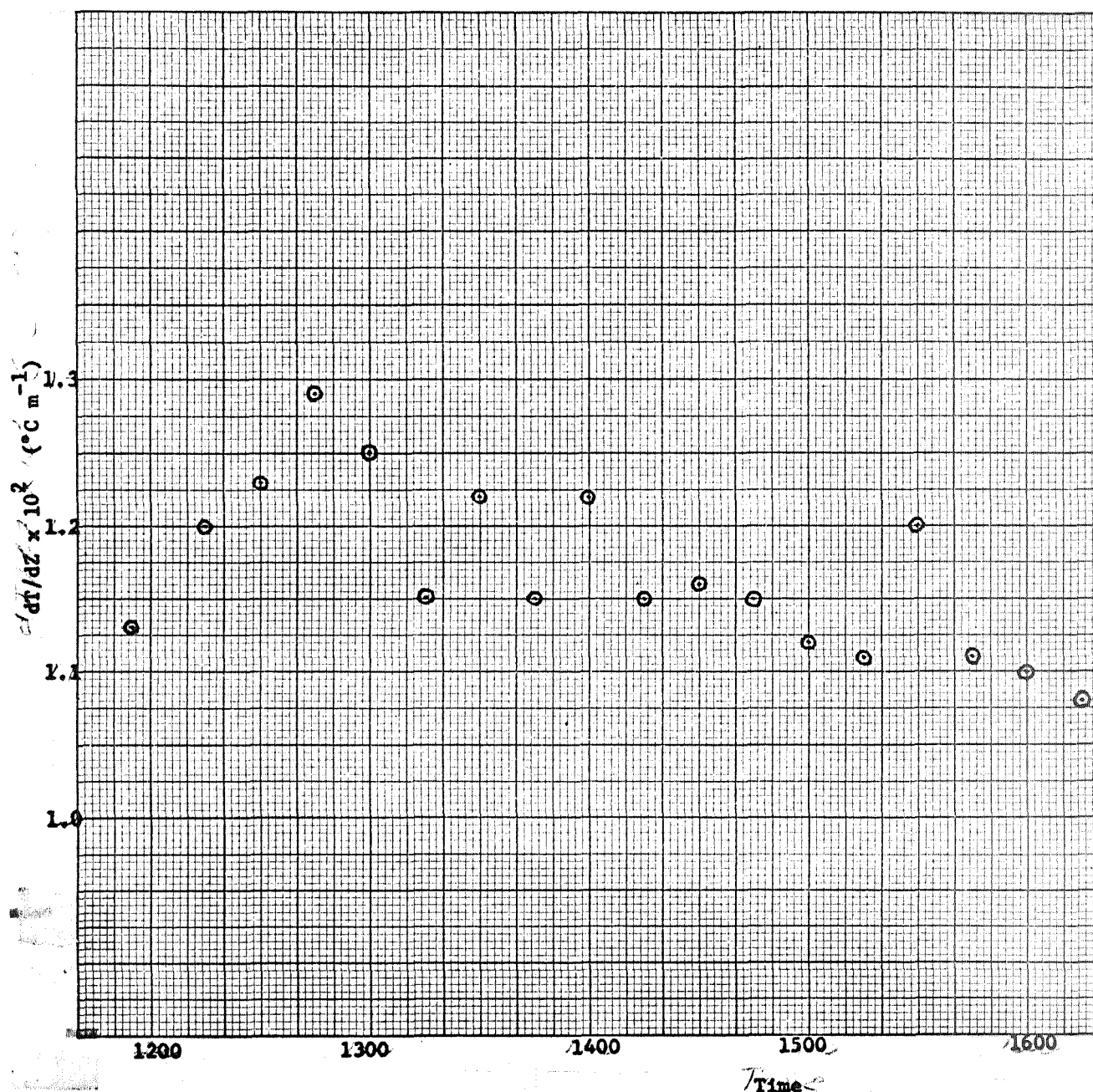
9-5-68

1615 PDT



FORM 30-692-9 (8-68)

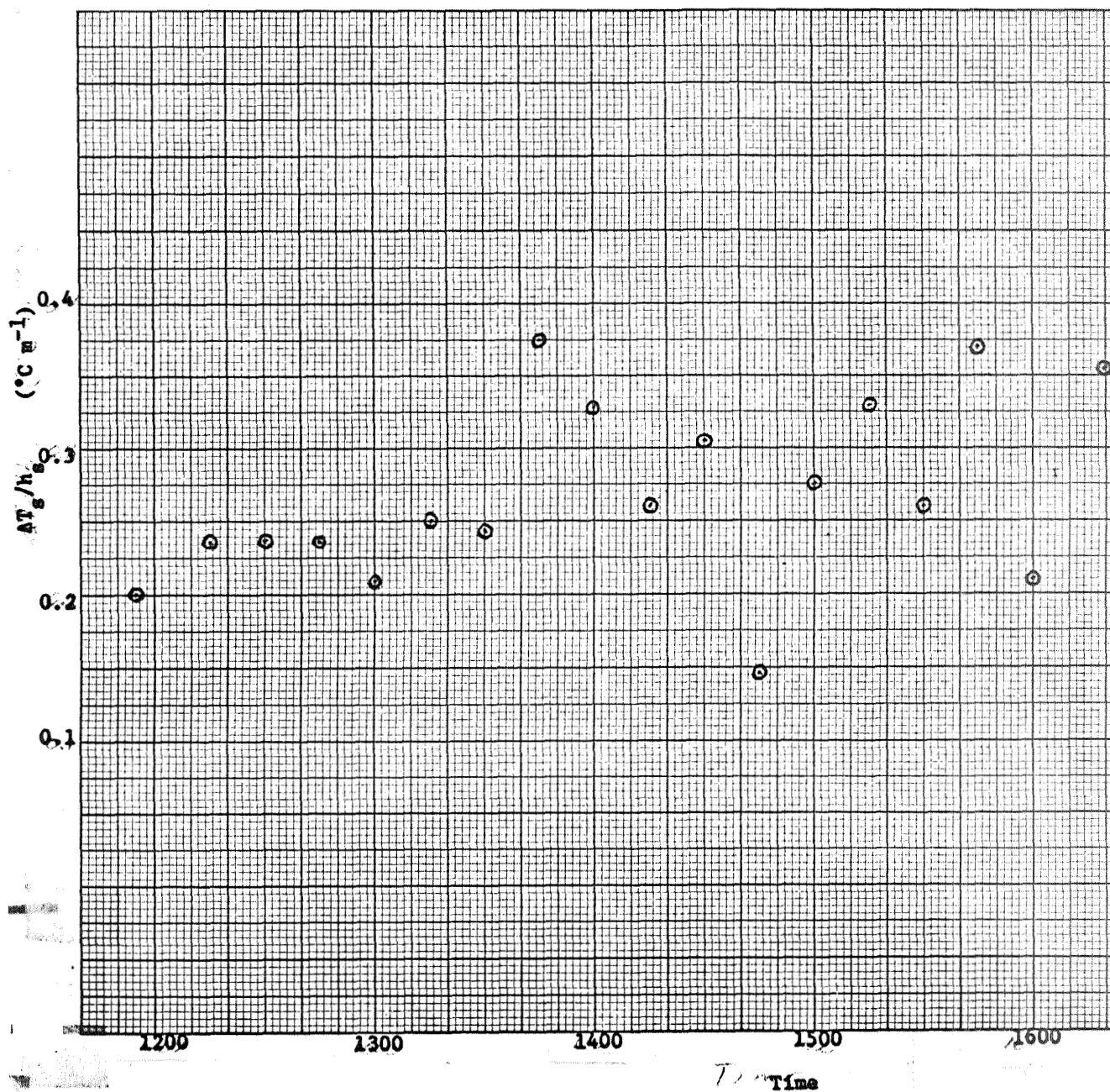




9-5-68

Lapse Rate ($\frac{dT}{dZ}$)

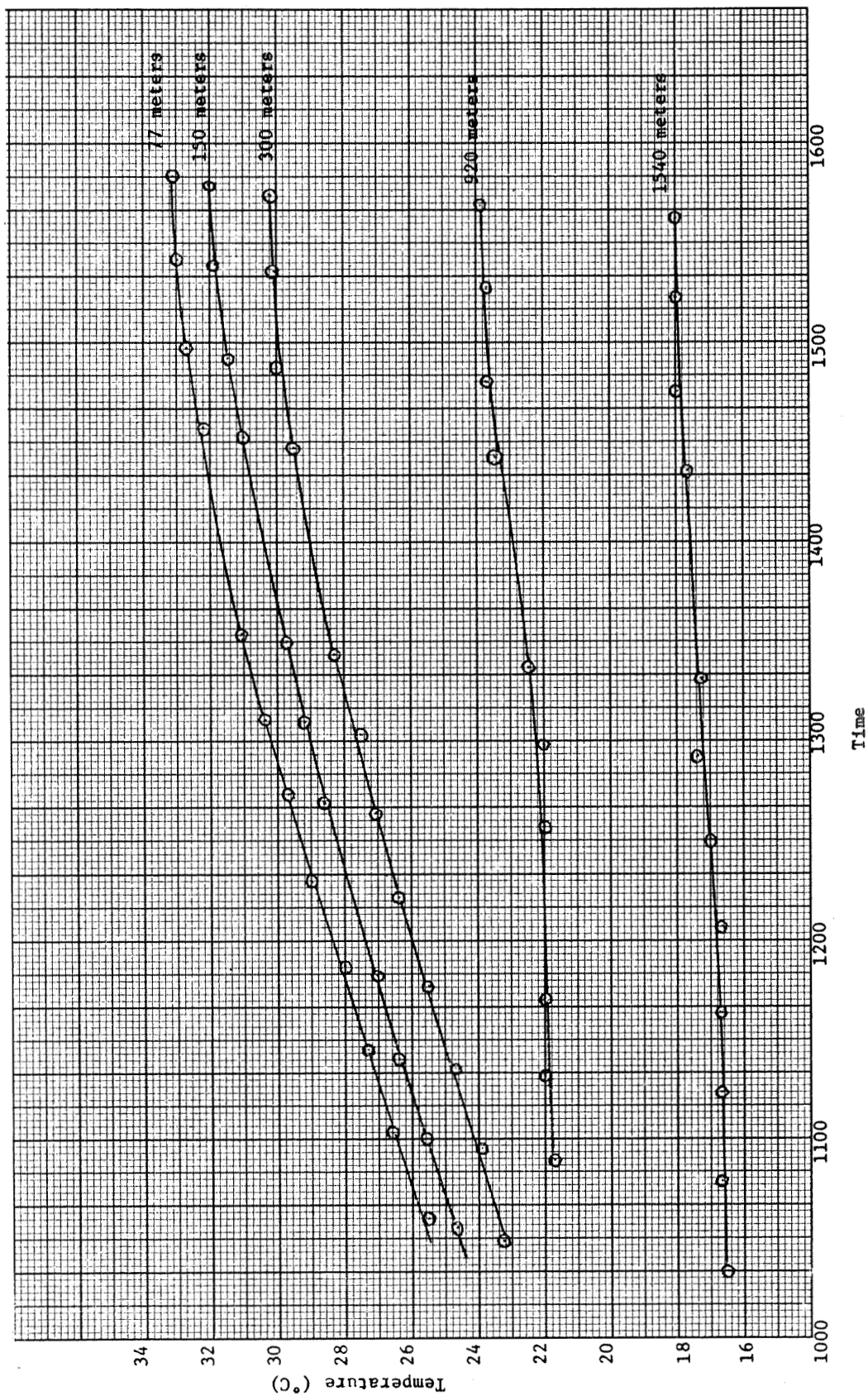
vs. Time



9-5-68

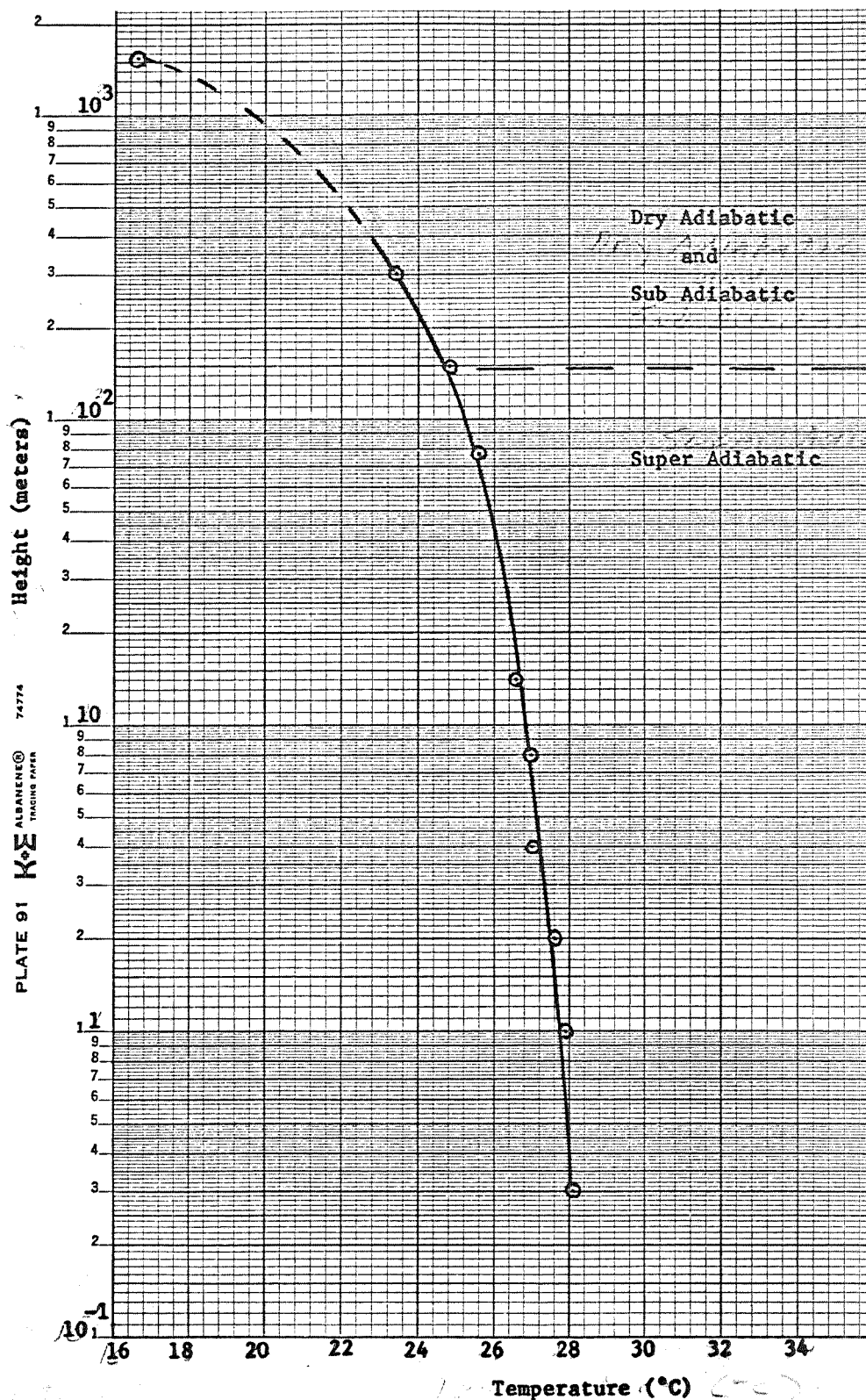
$\Delta T_s/h_s$ vs. Time

DATA FOR 9-12-68



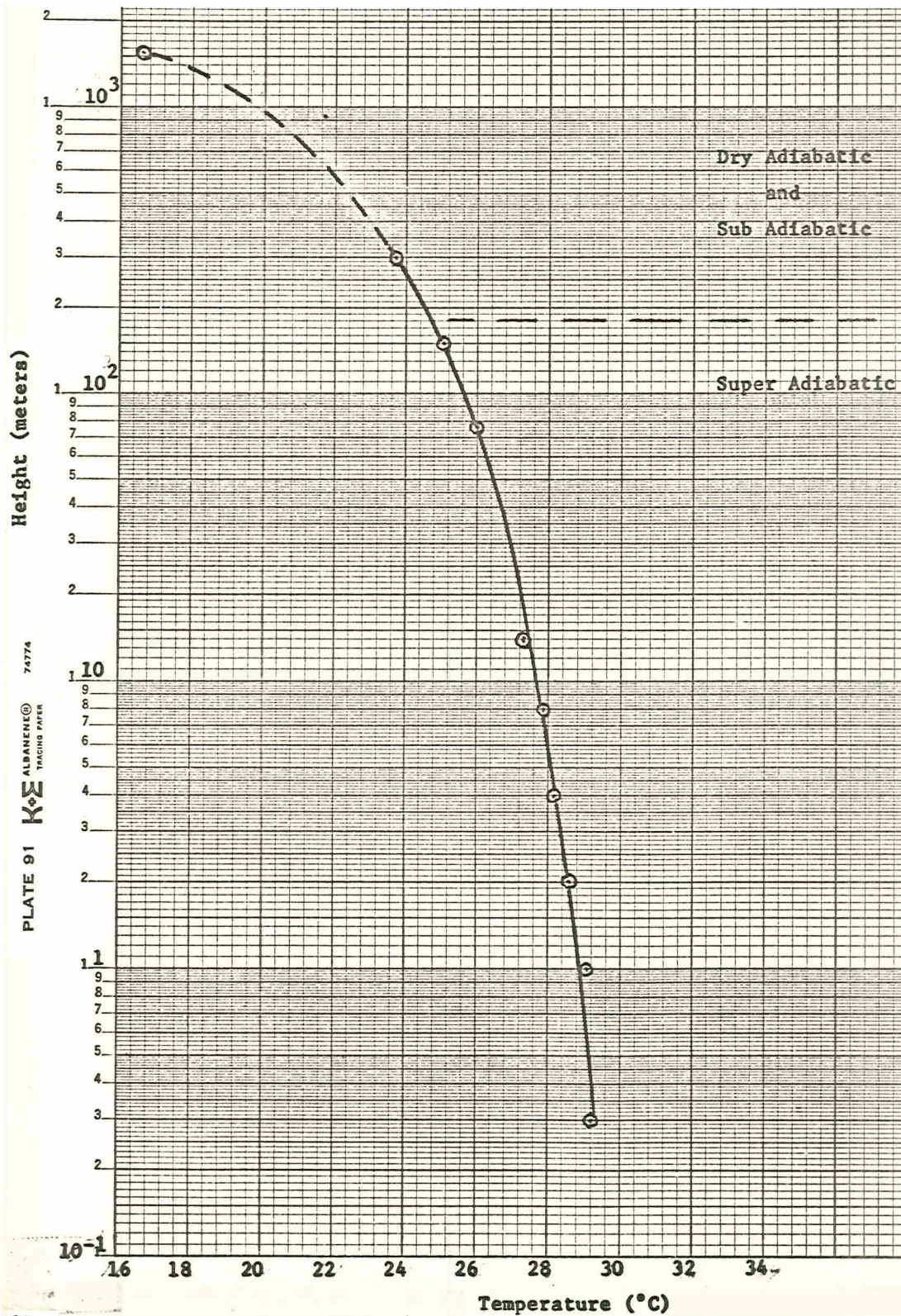
9-12-68

Aircraft Soundings



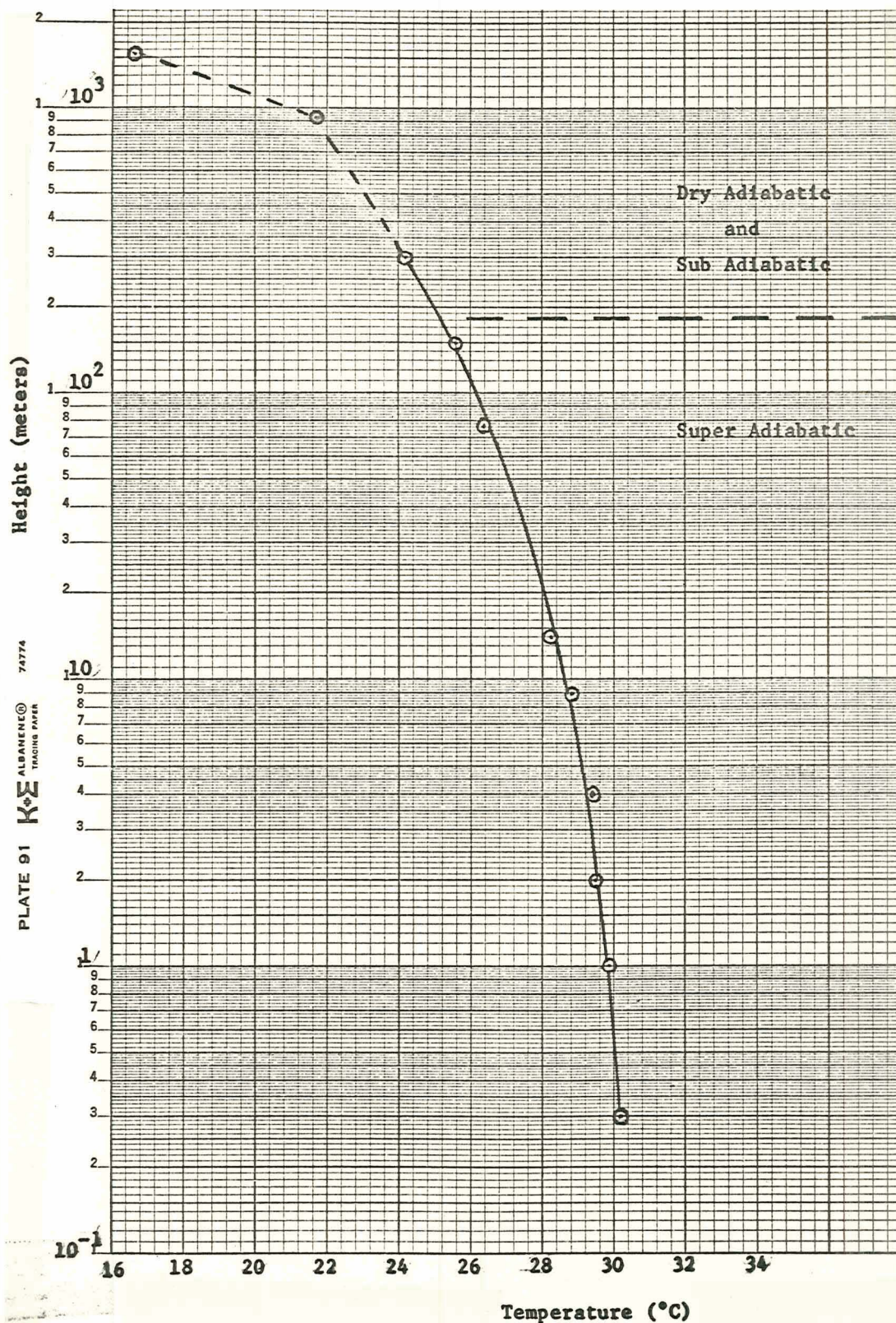
9-12-68

1035 PDT



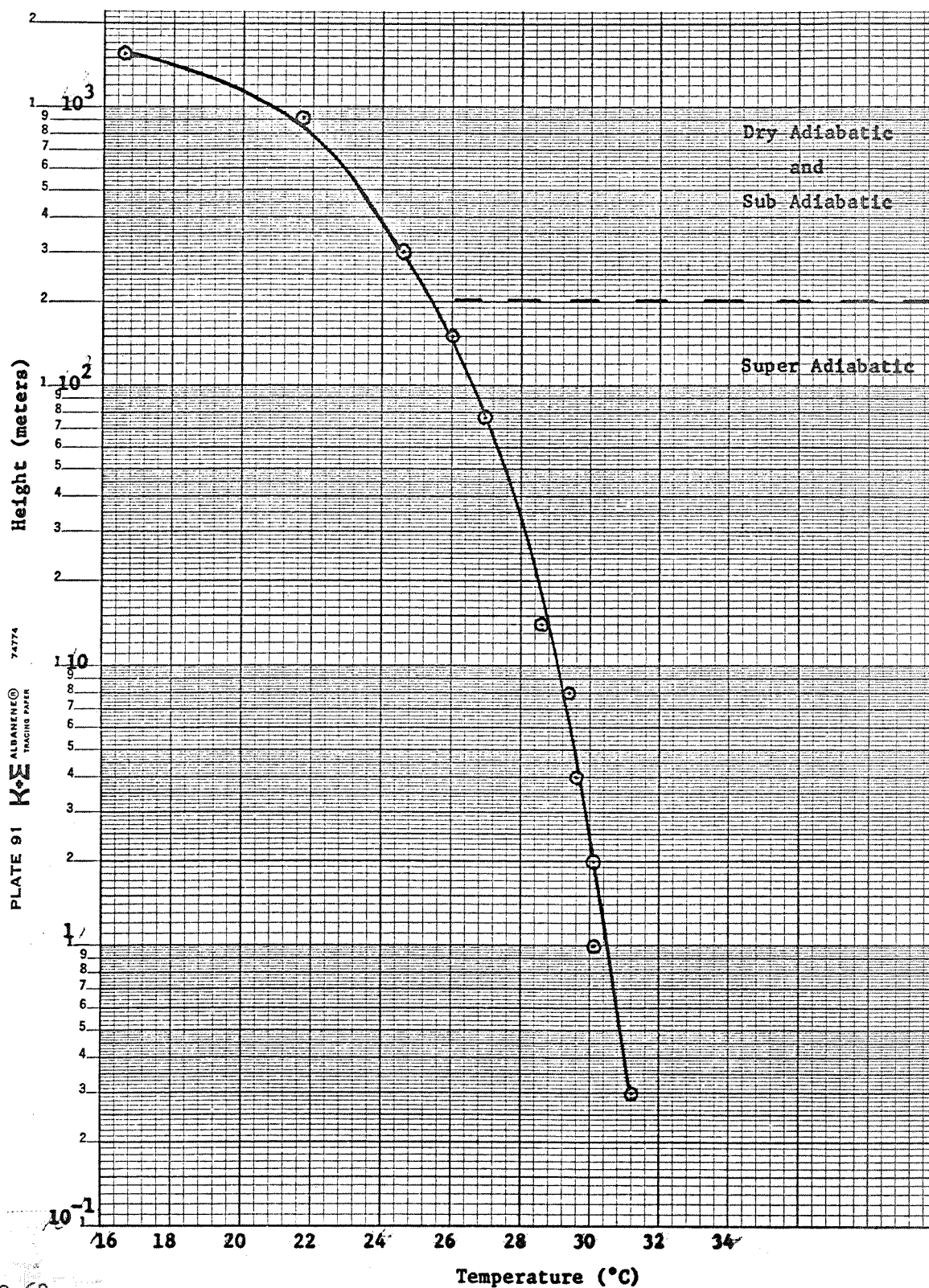
9-12-68

1045 PDT



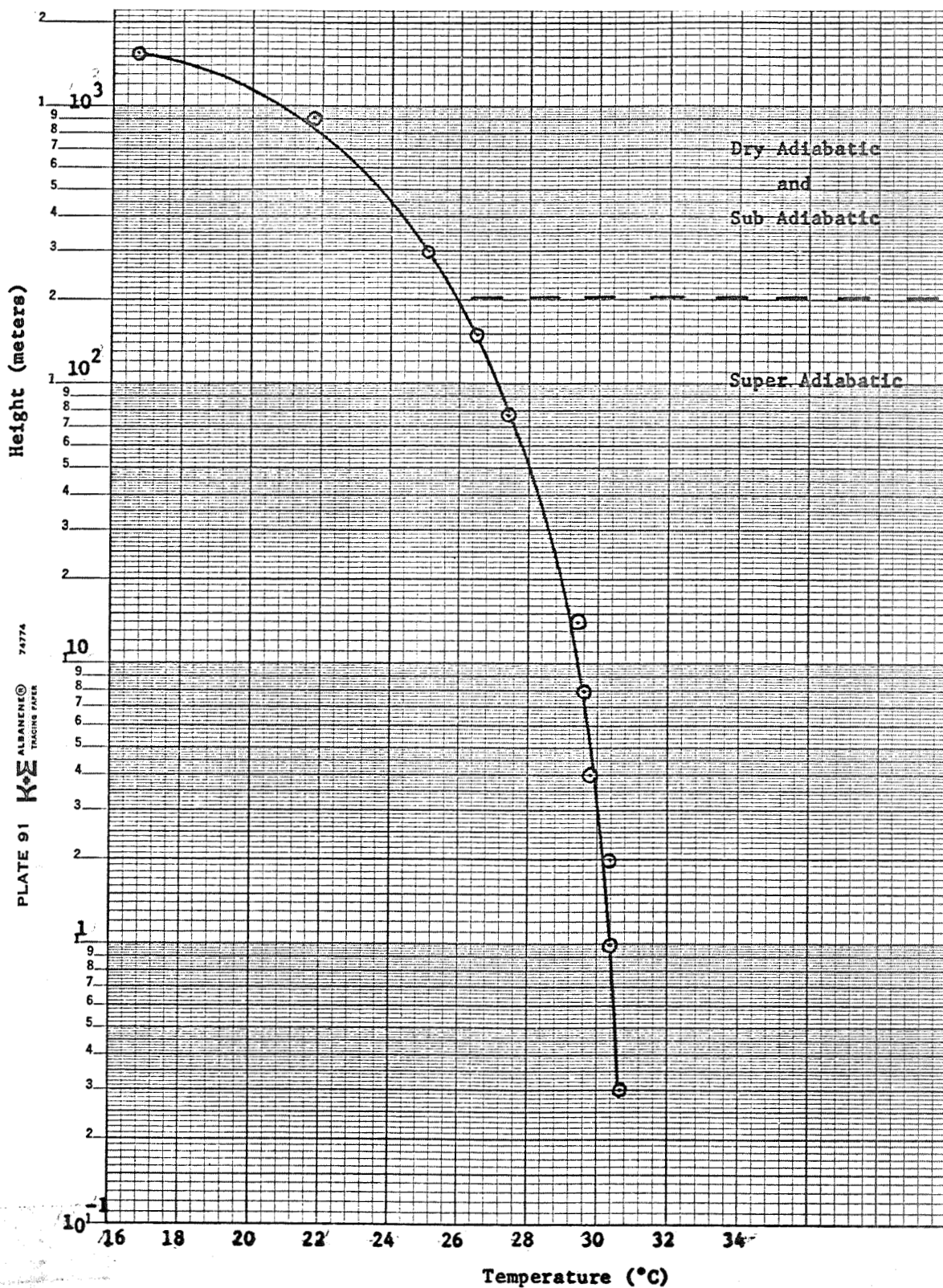
9-12-68

1100 PDT



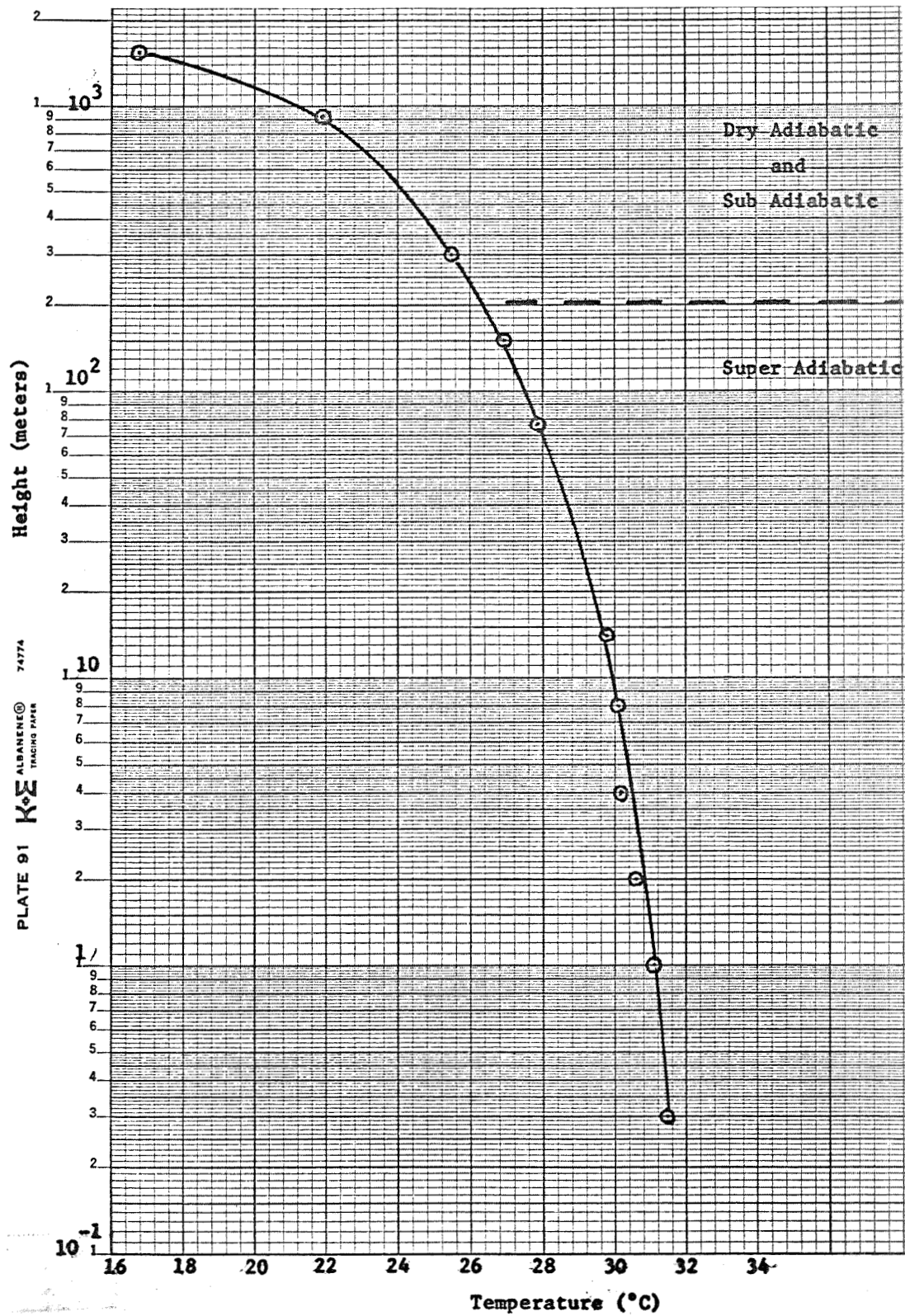
9-12-68

1115 PDT



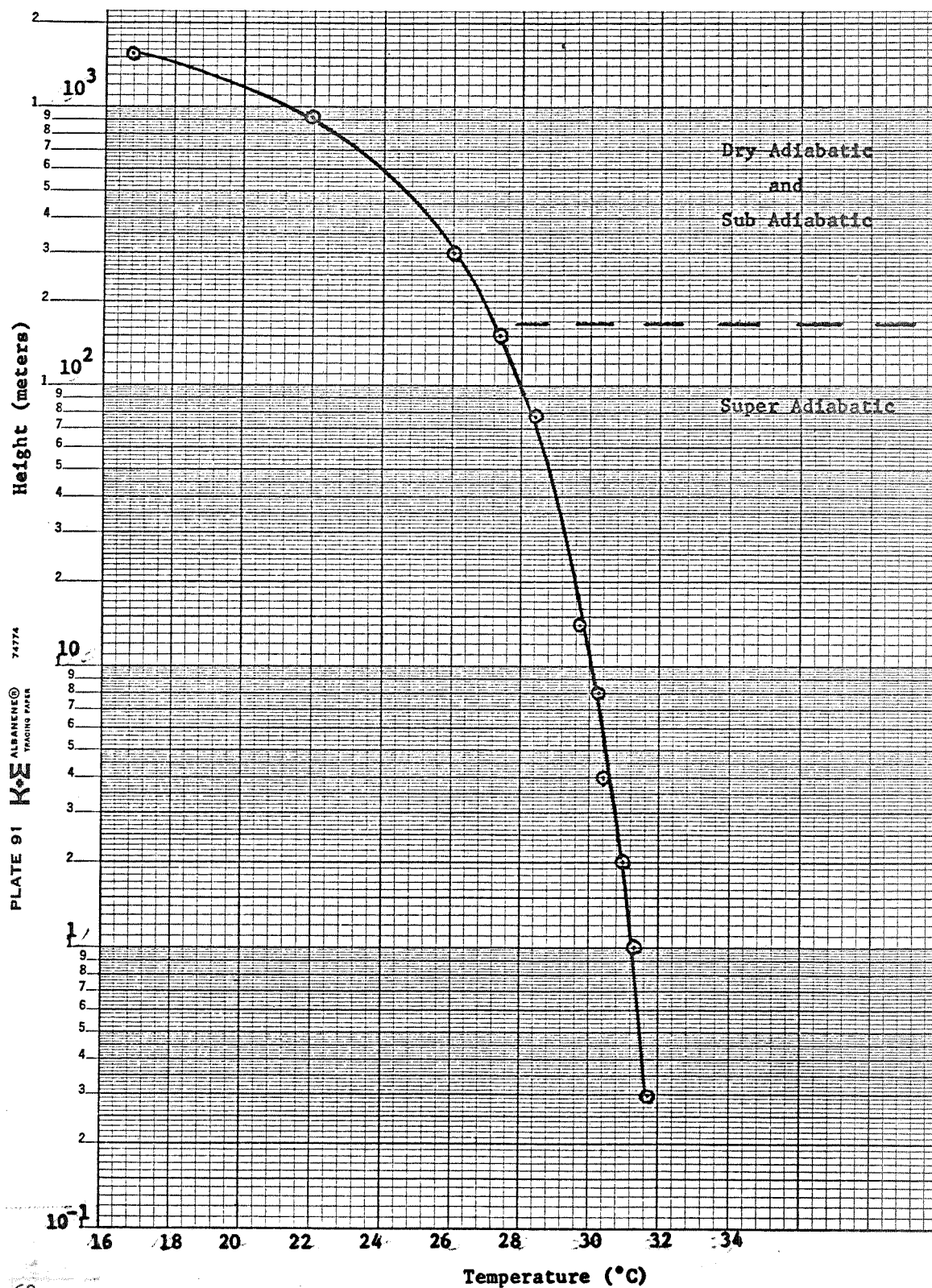
9-12-68

1130 PDT



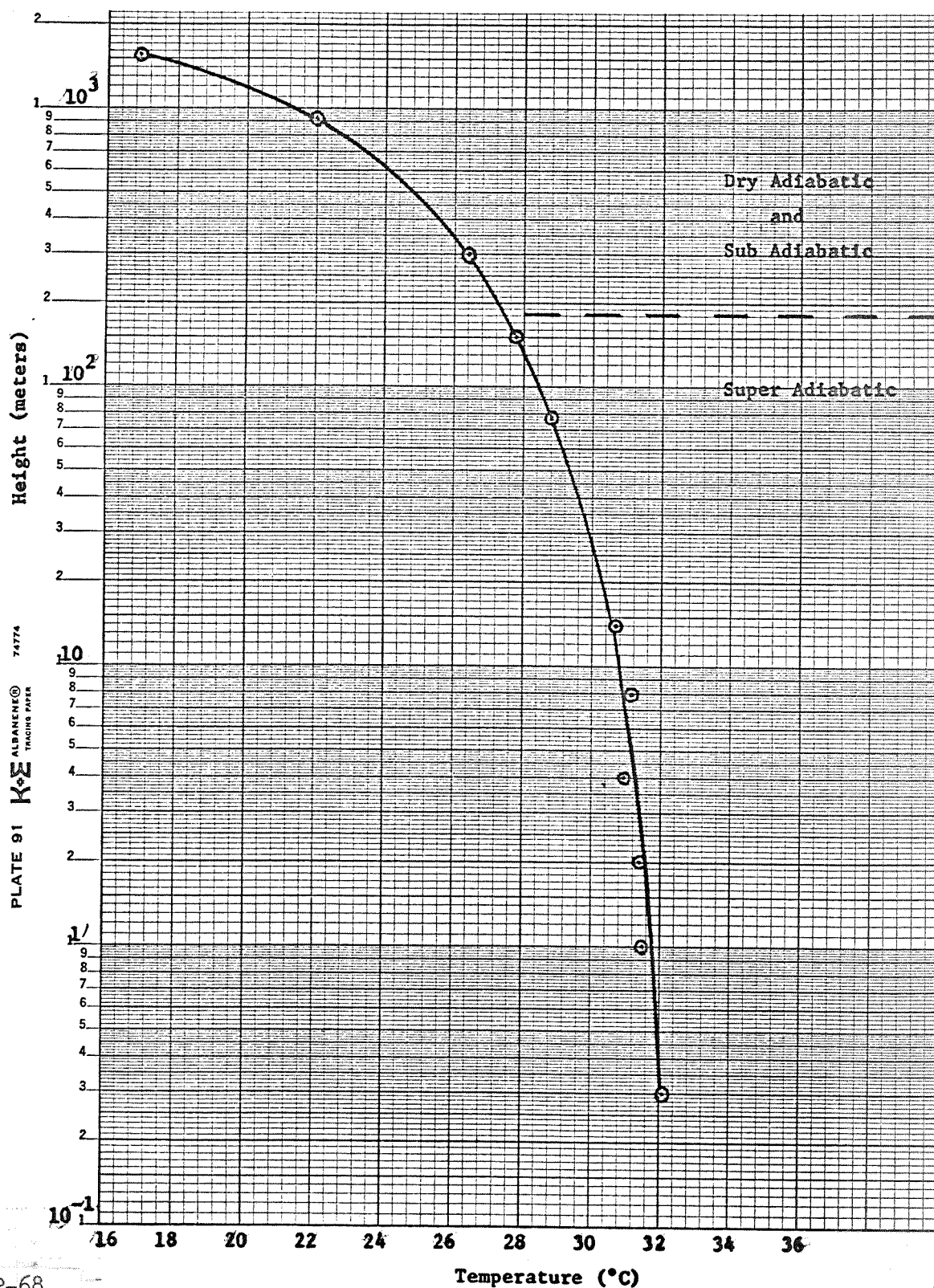
8-12-68

1145 PDT



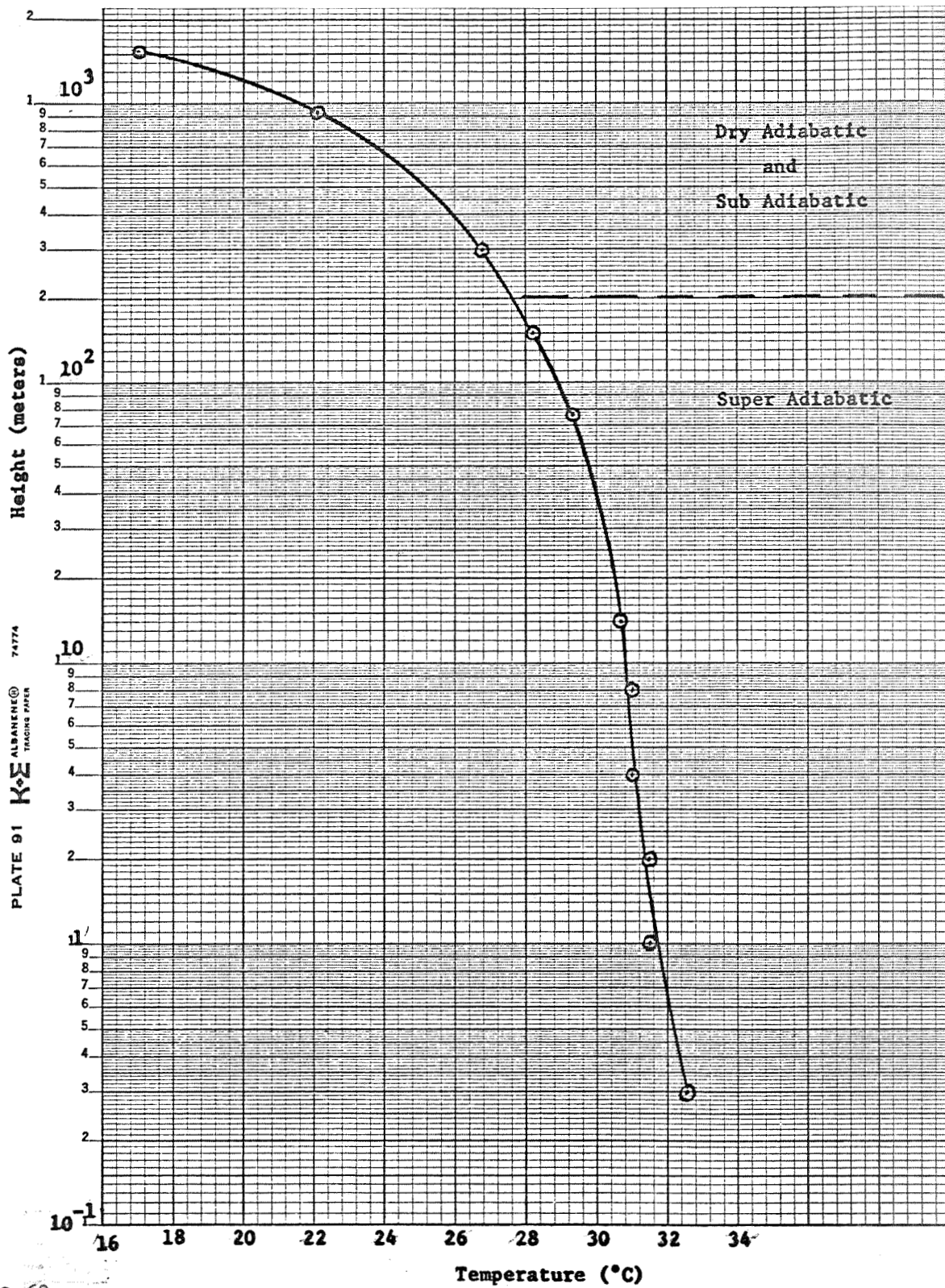
9-12-68

1200 PDT



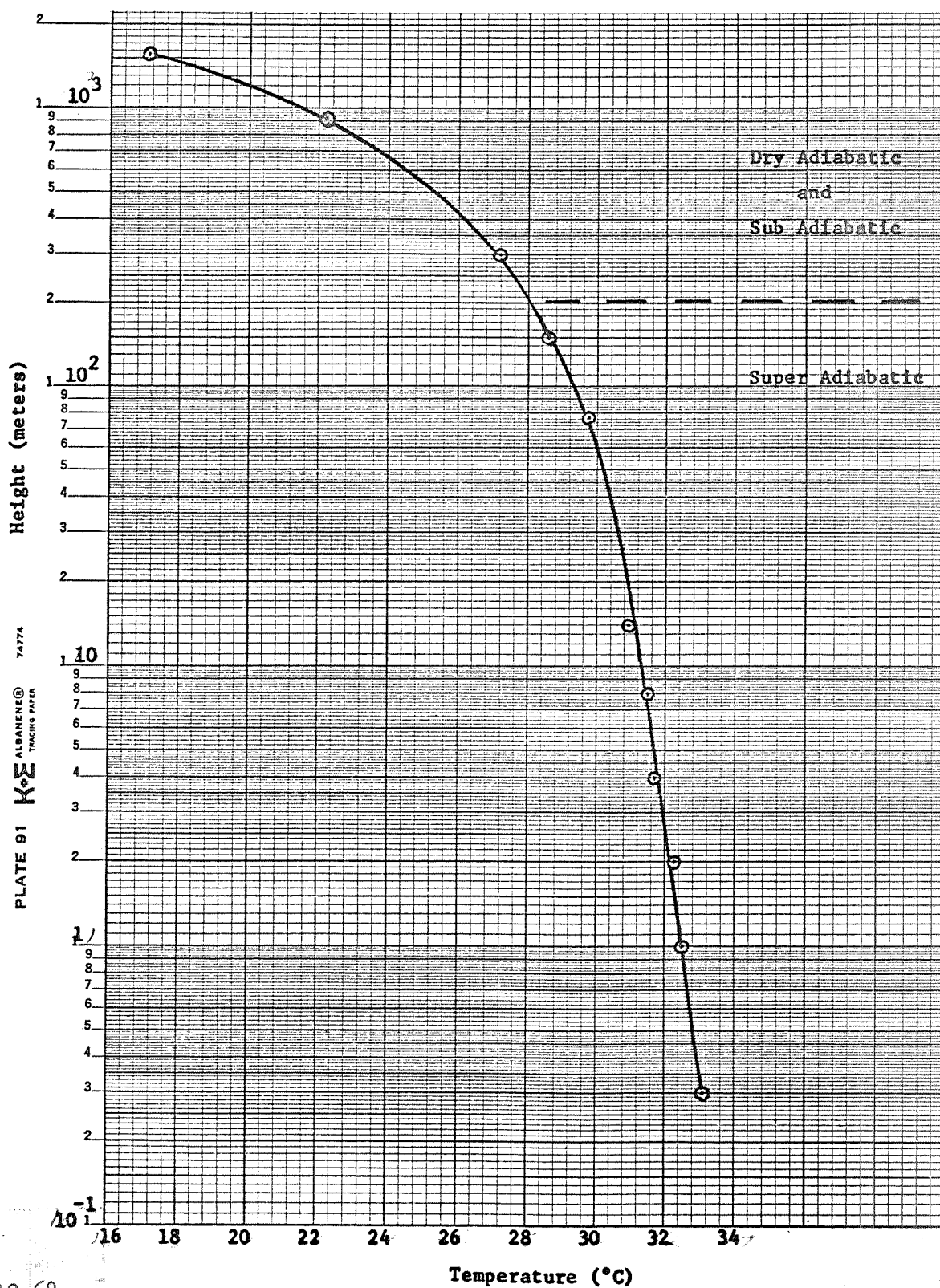
9-12-68

1215 PDT



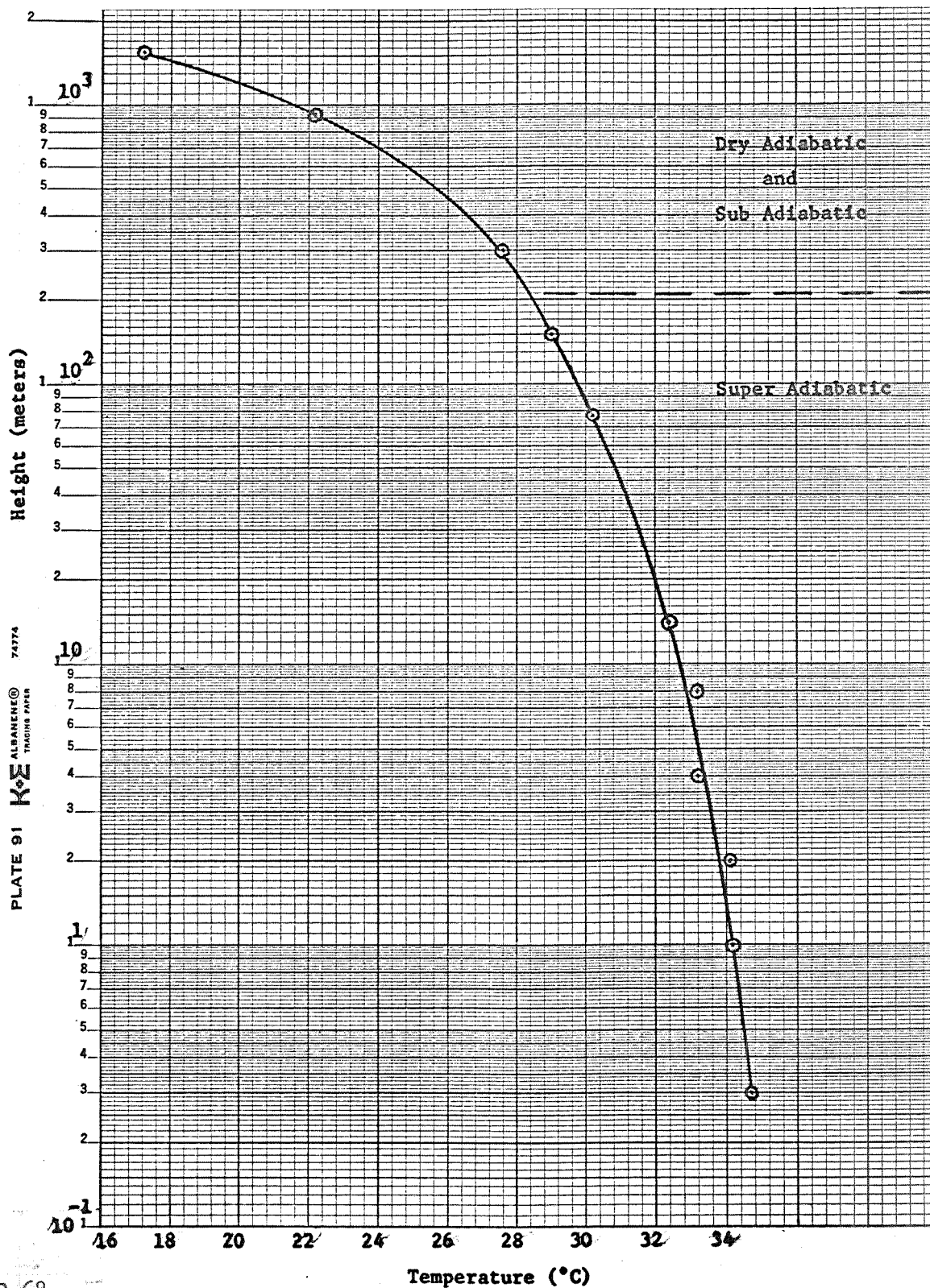
9-12-68

1230 PDT



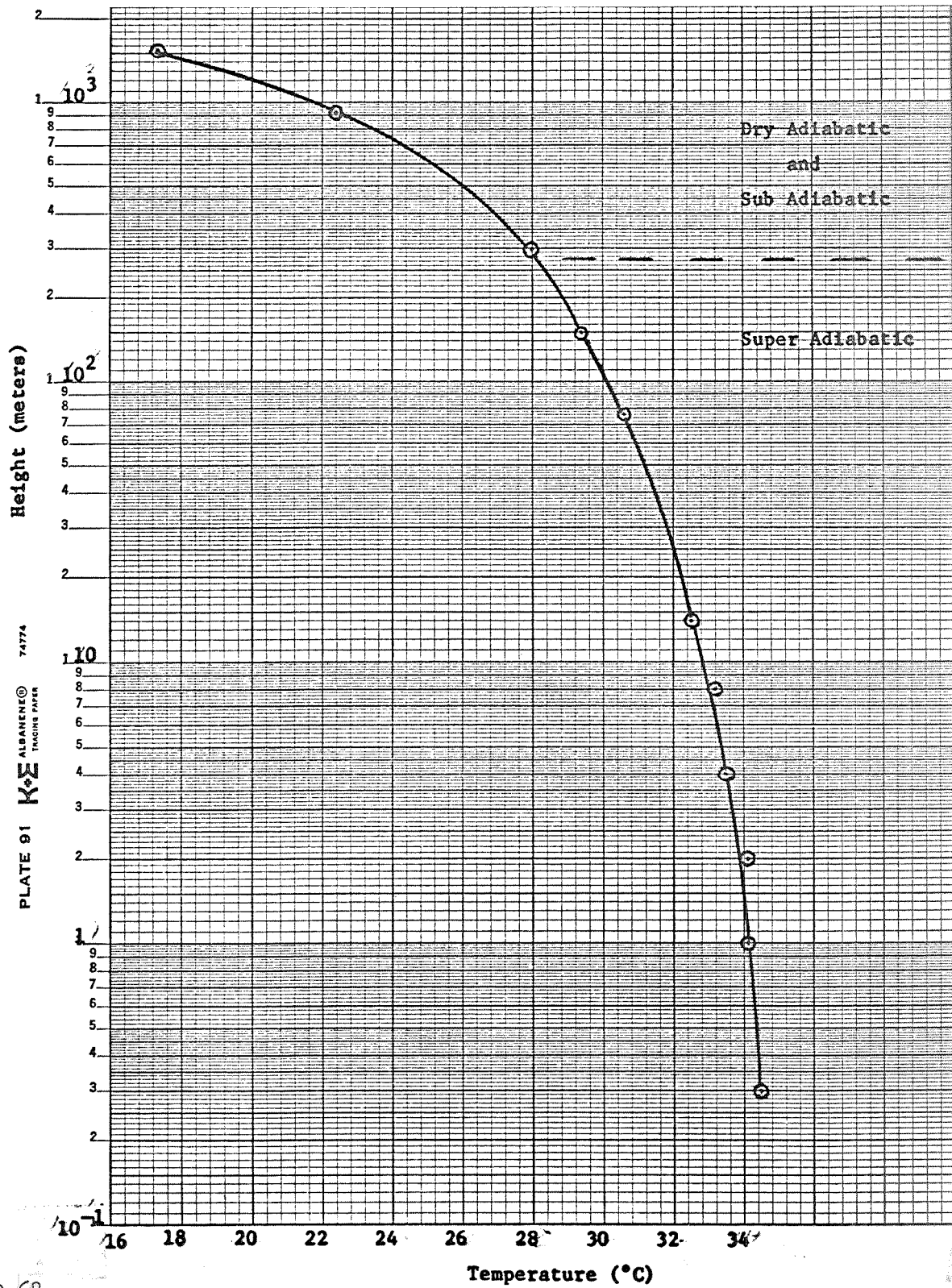
9-12-68

1245 PDT



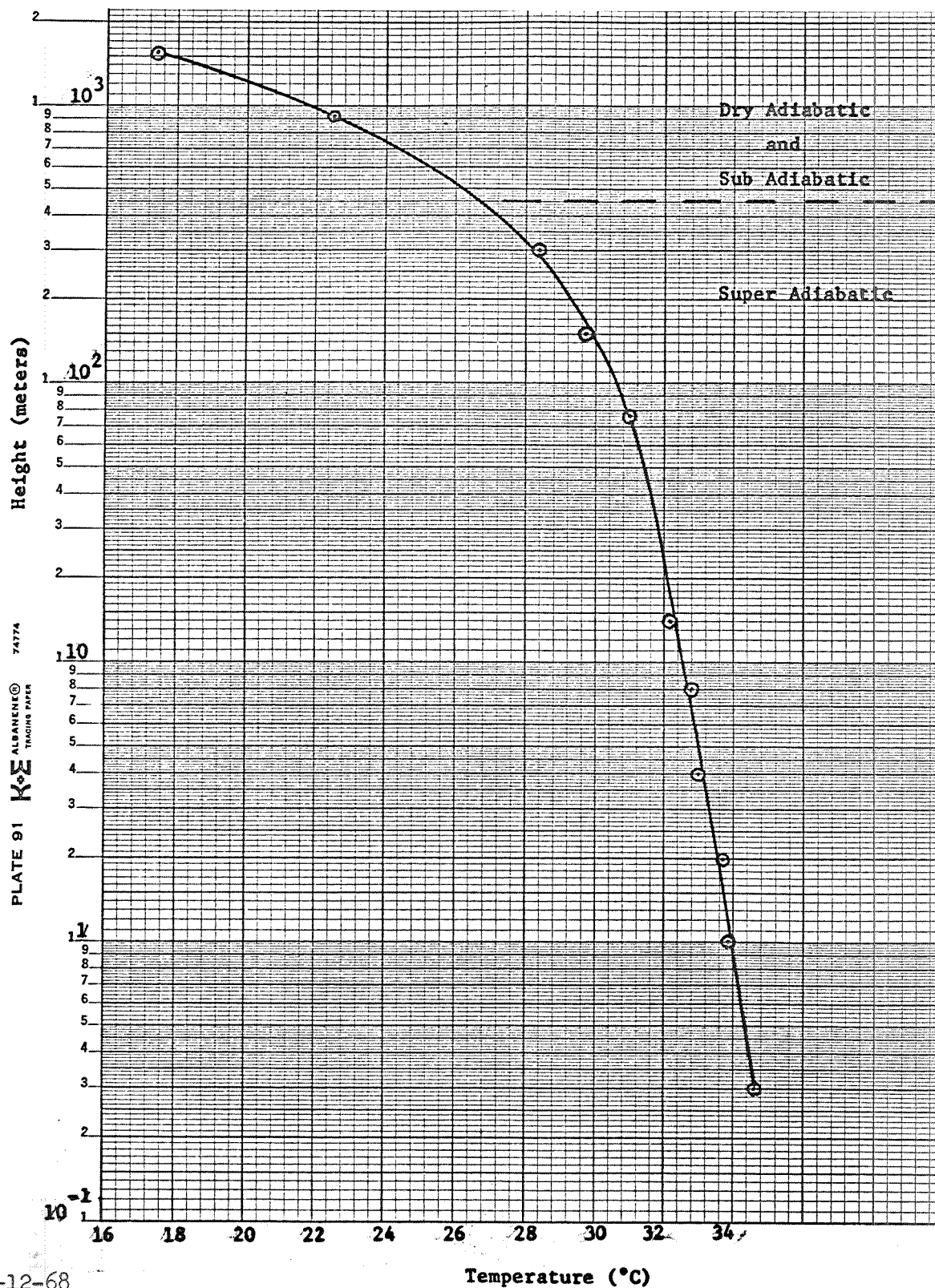
9-12-68

1303 PDT



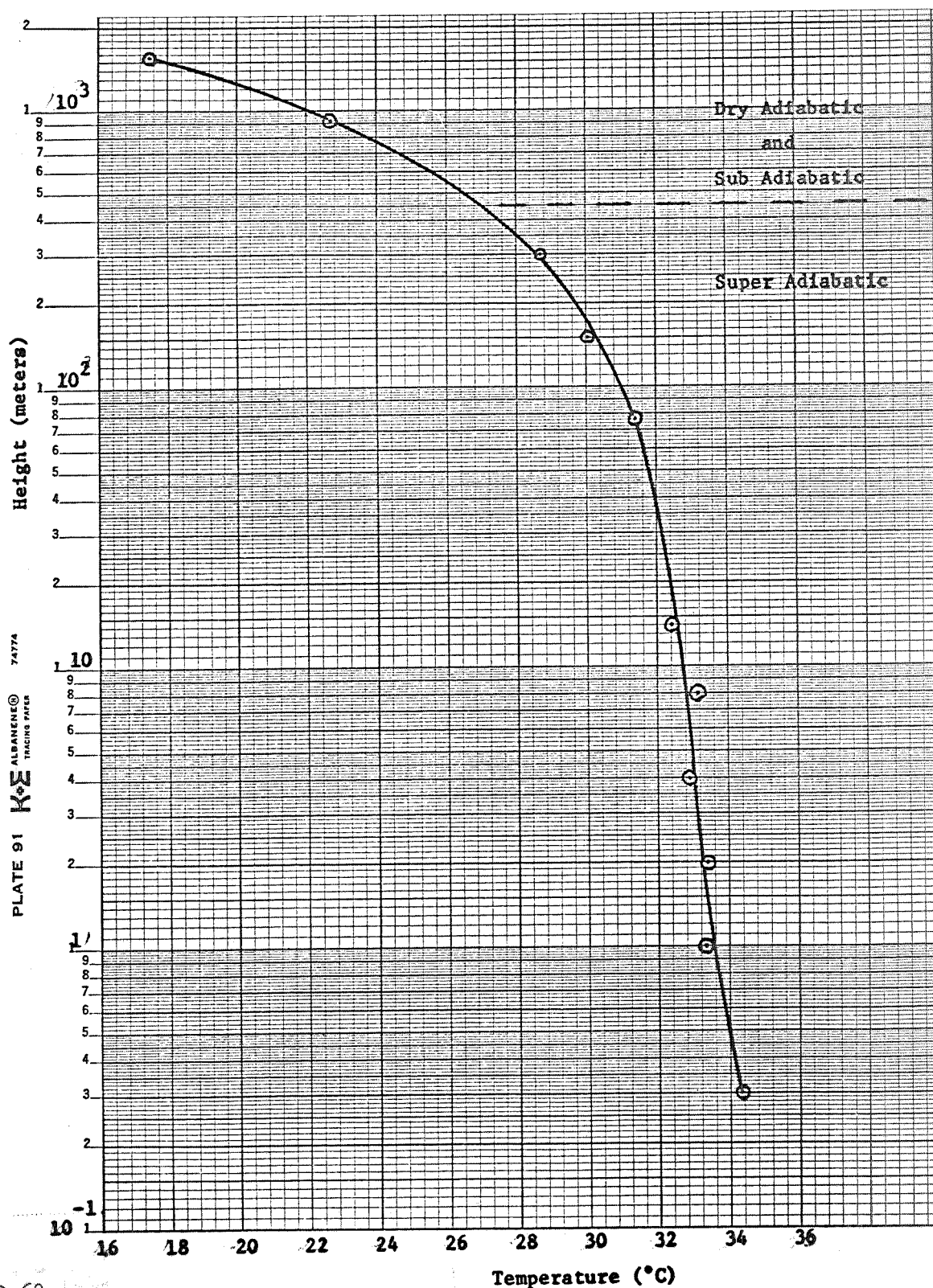
9-12-68

1317 PDT



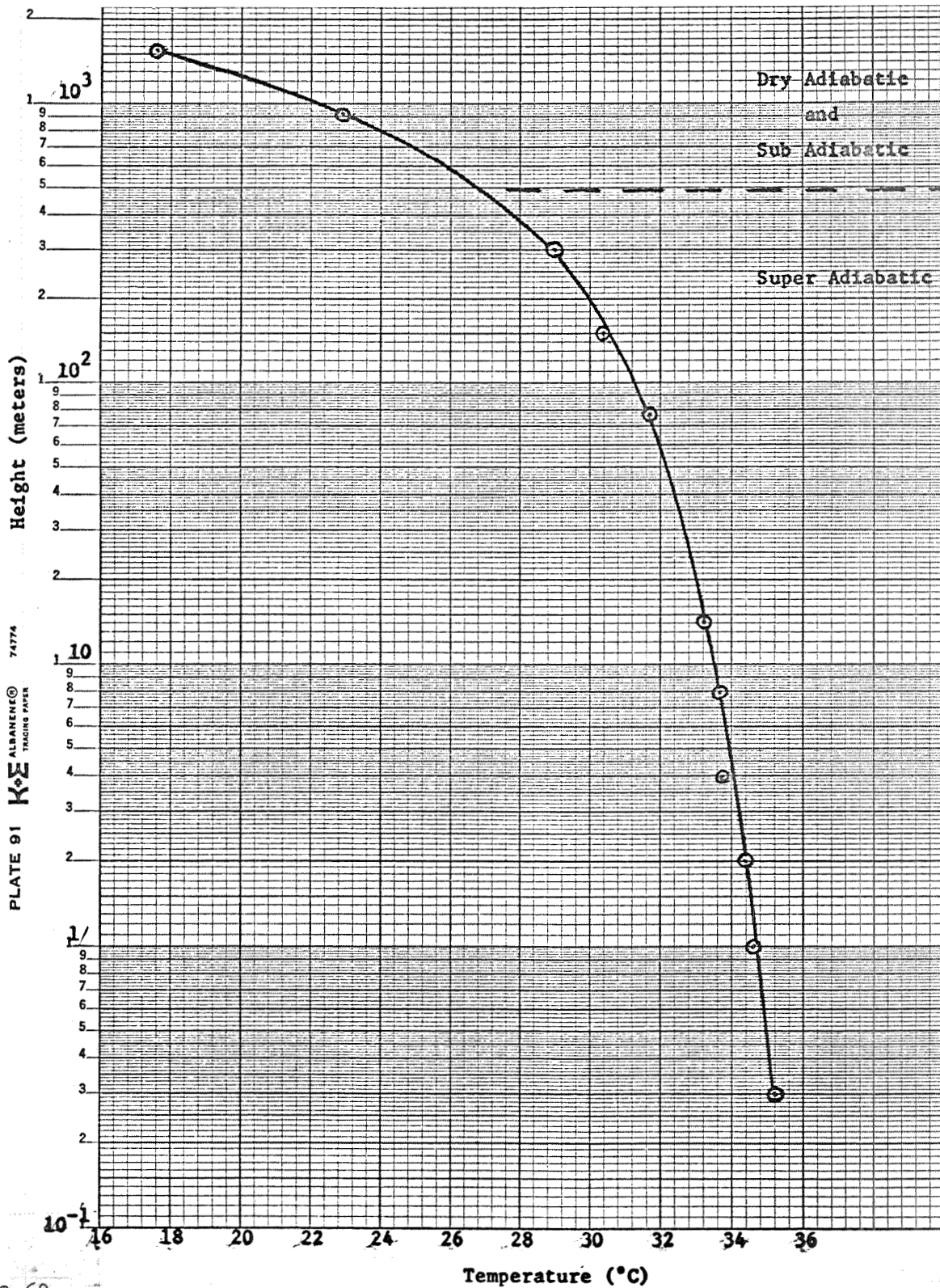
9-12-68

1330 PDT



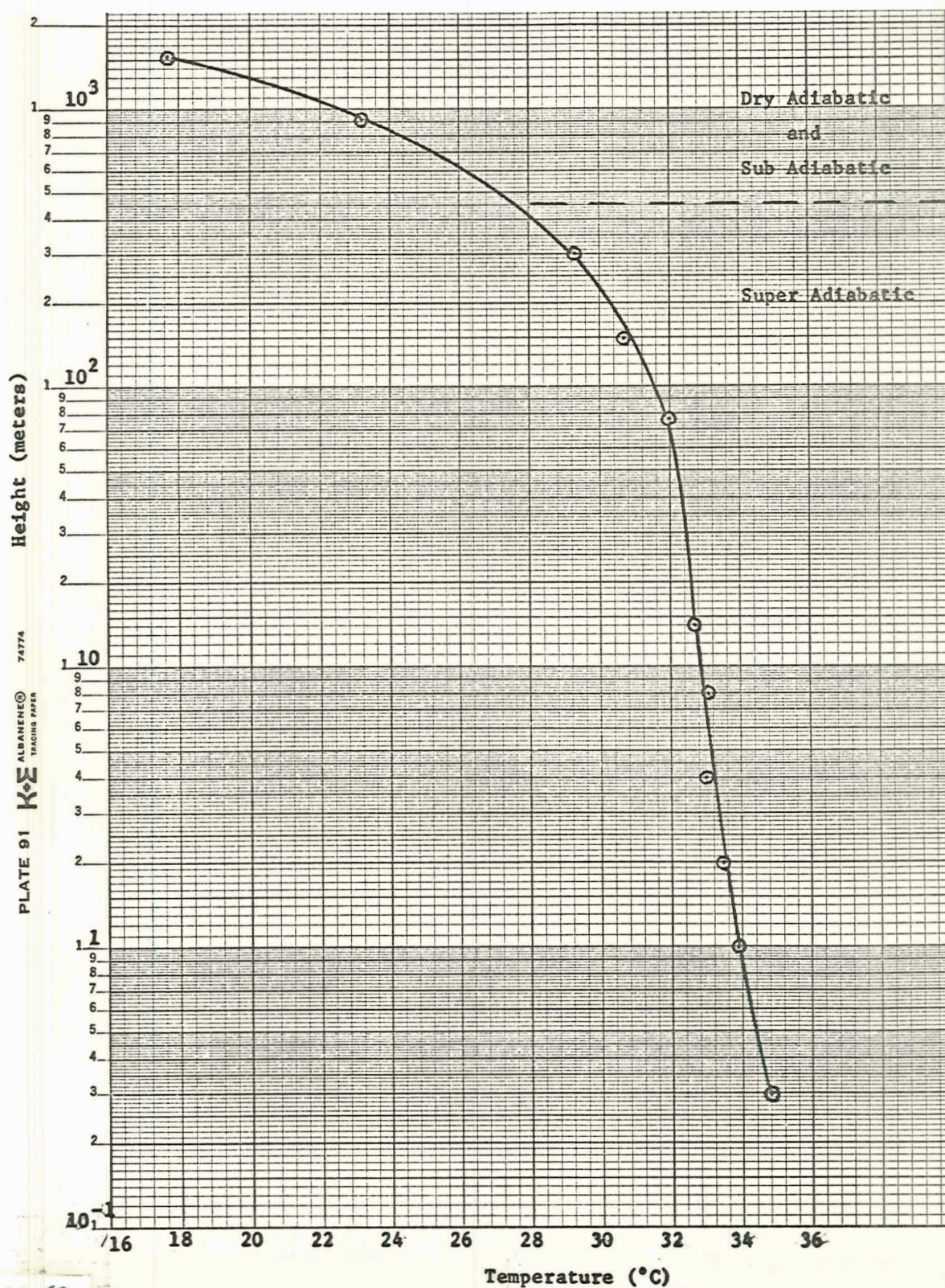
9-12-68

1345 PDT



9-12-68

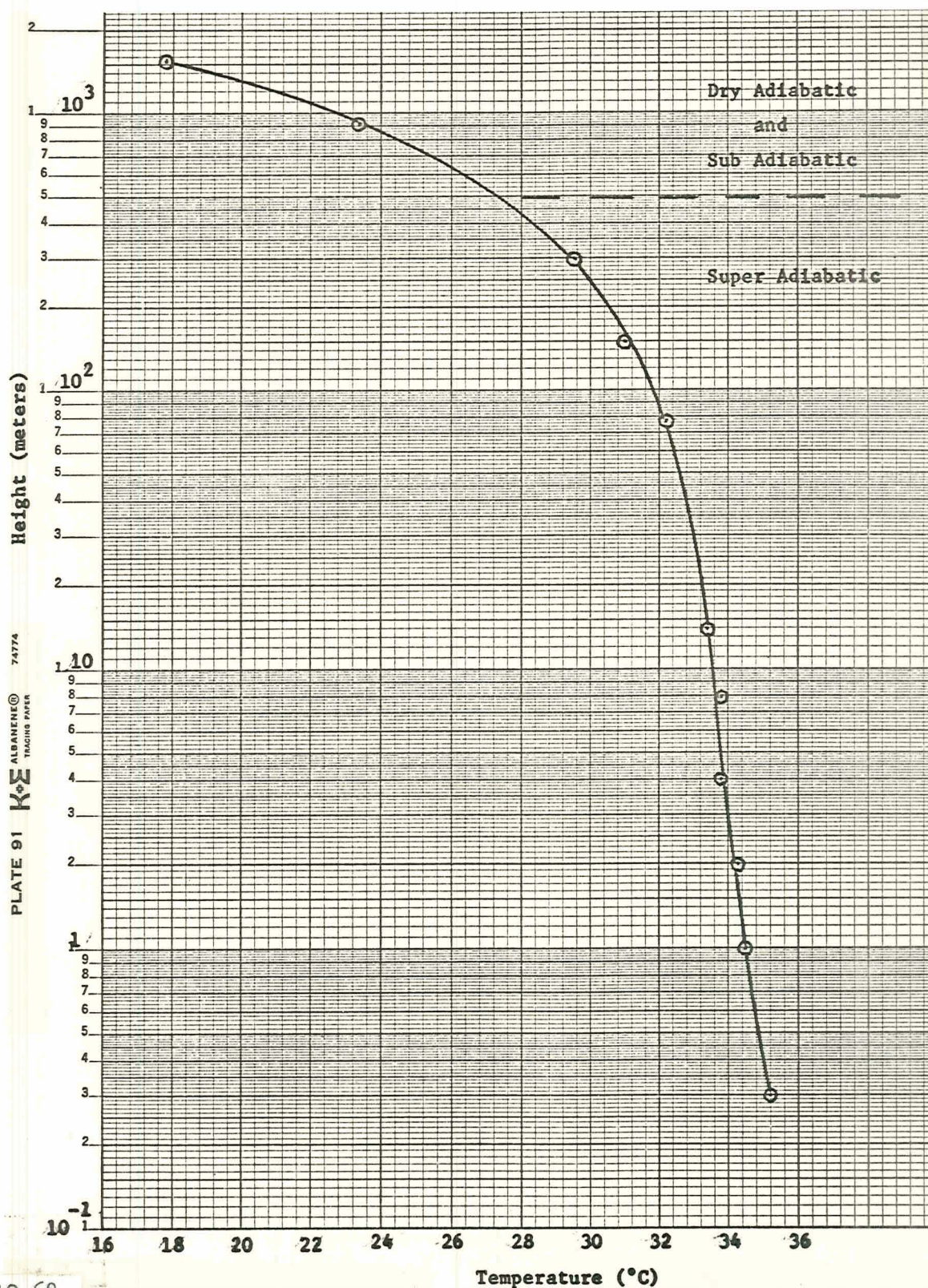
1400 PDT



9-12-68

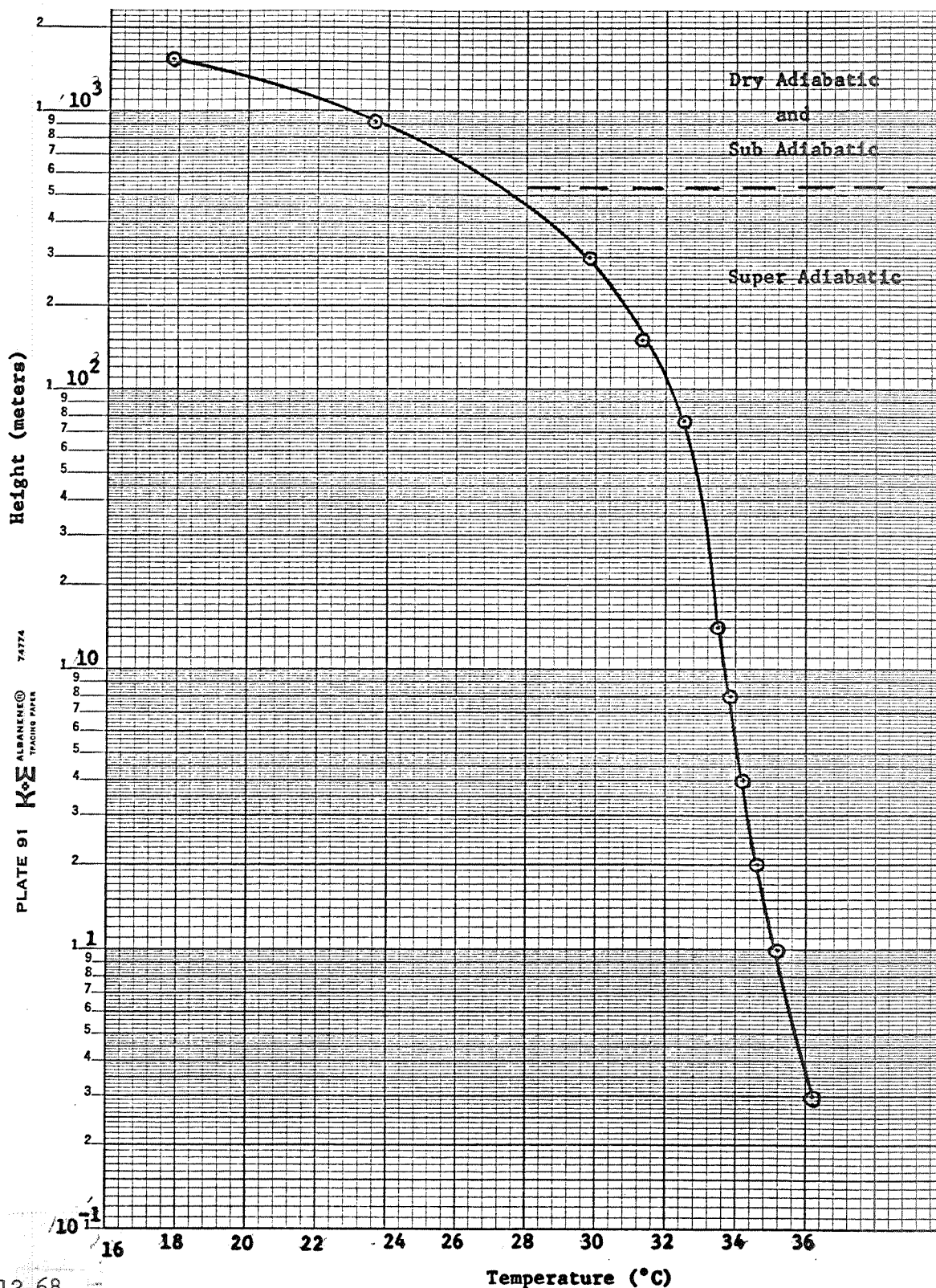
1415 PDT

M 30-692-6 (8-68)



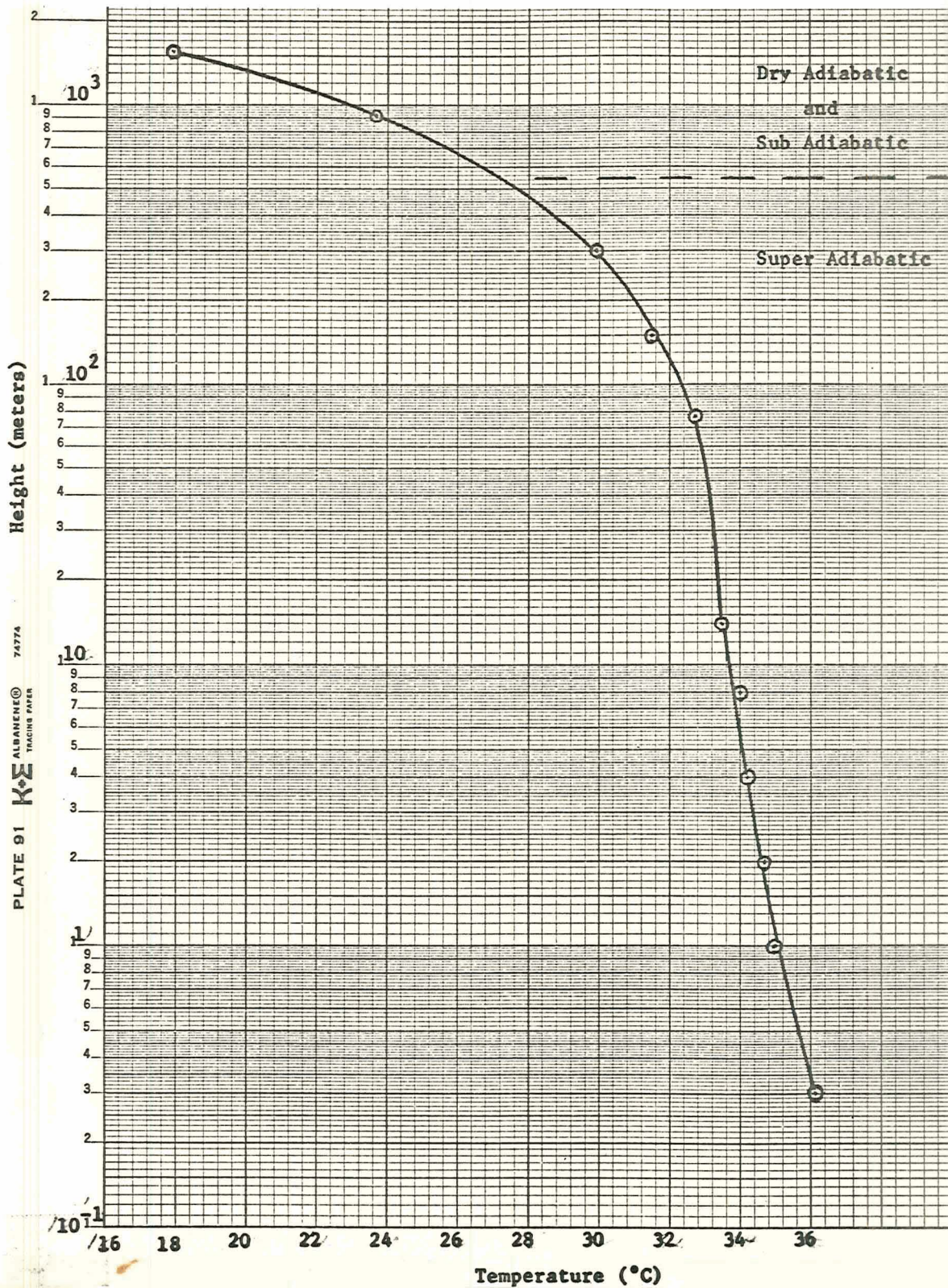
9-12-68

1430 PDT



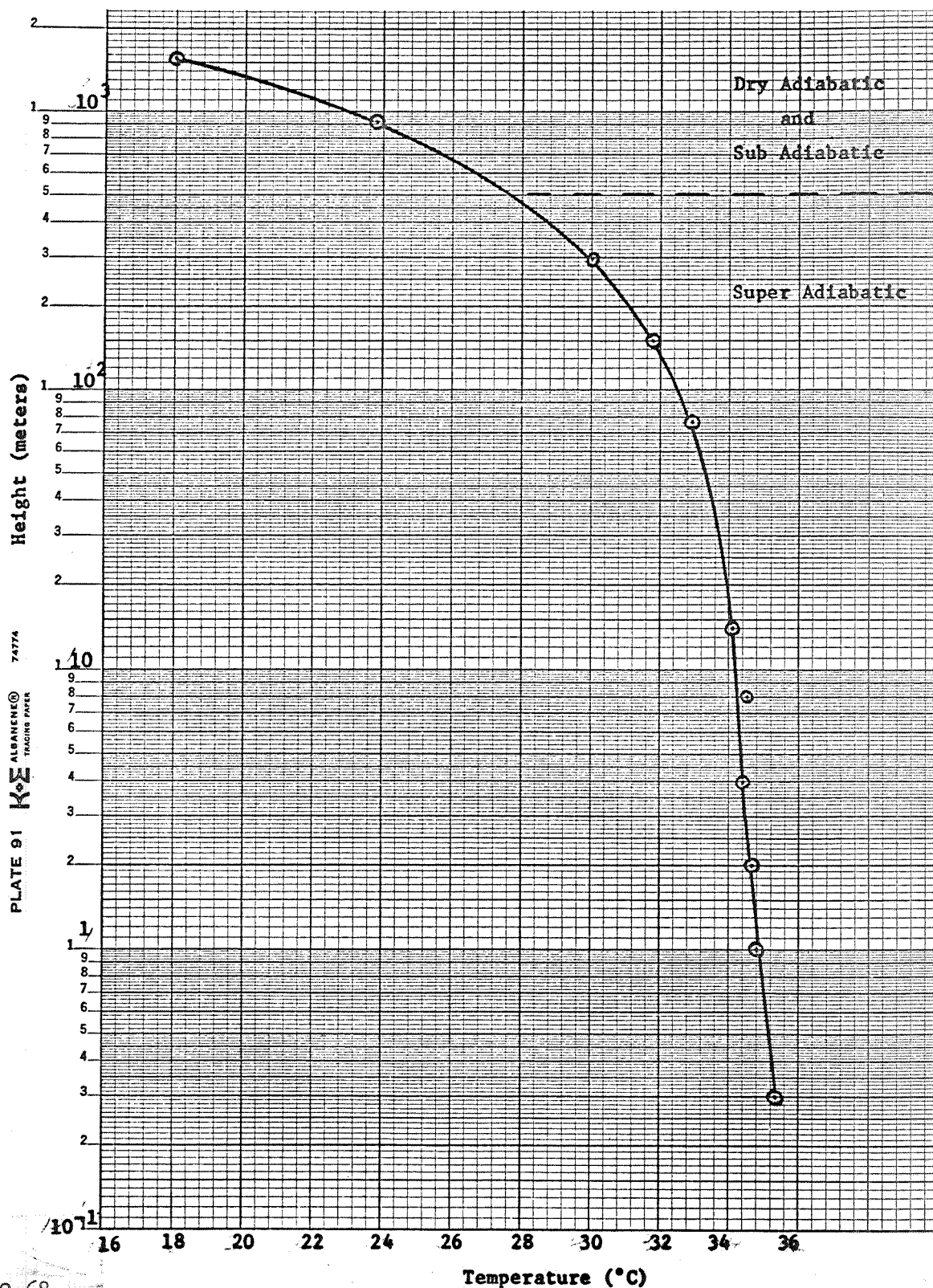
9-12-68

1448 PDT



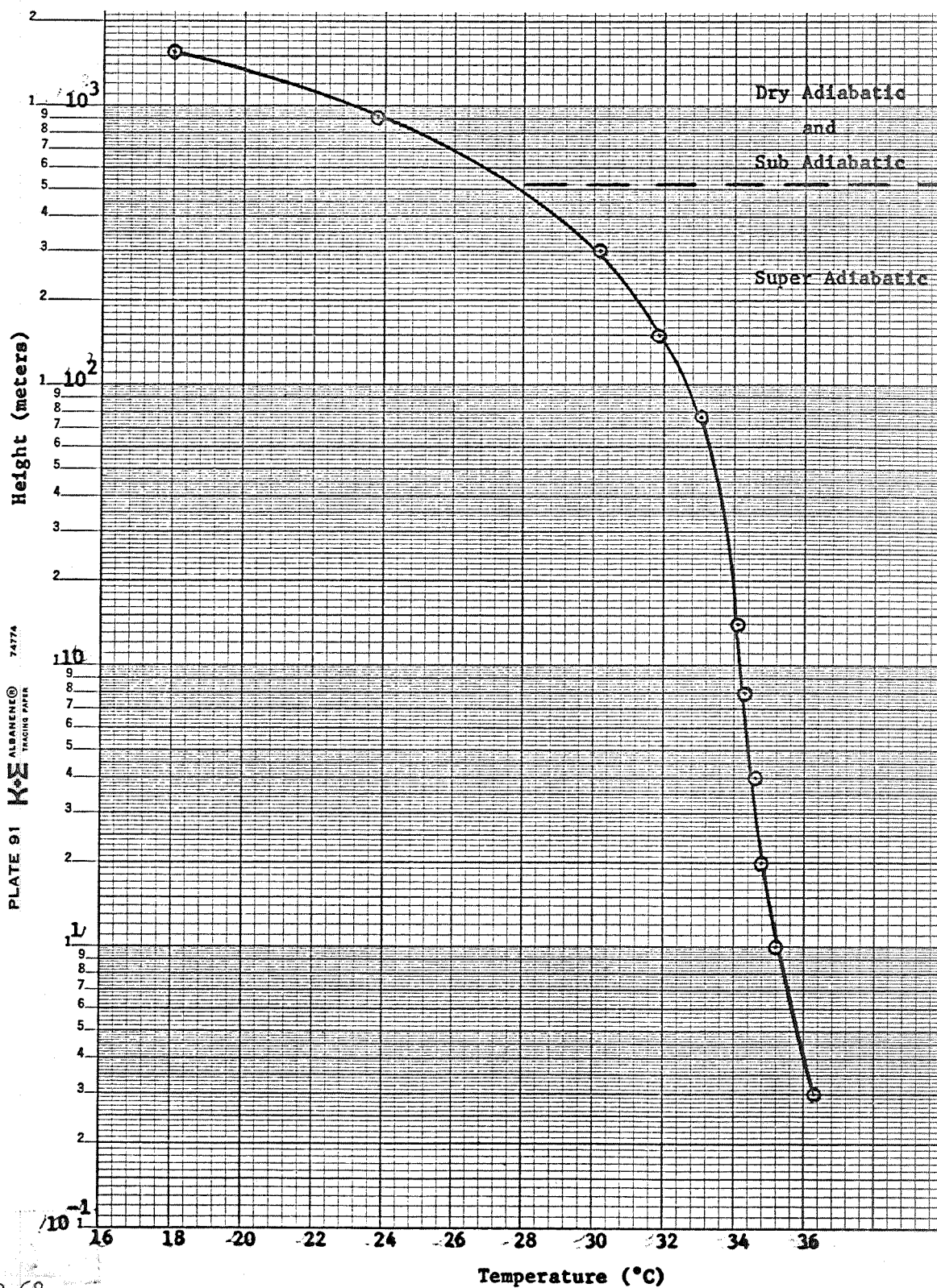
9-12-68

1502 PDT



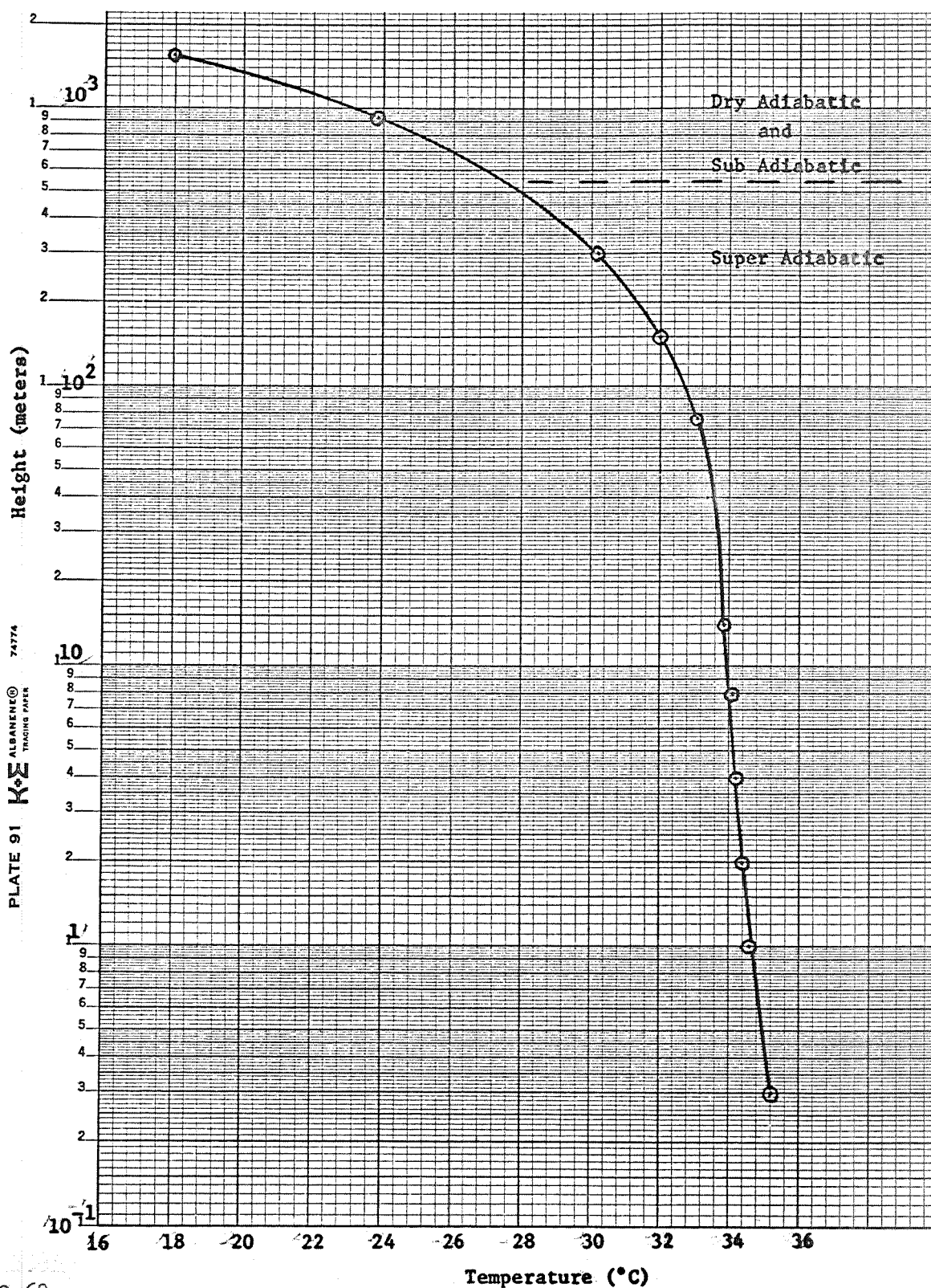
9-12-68

1515 PDT



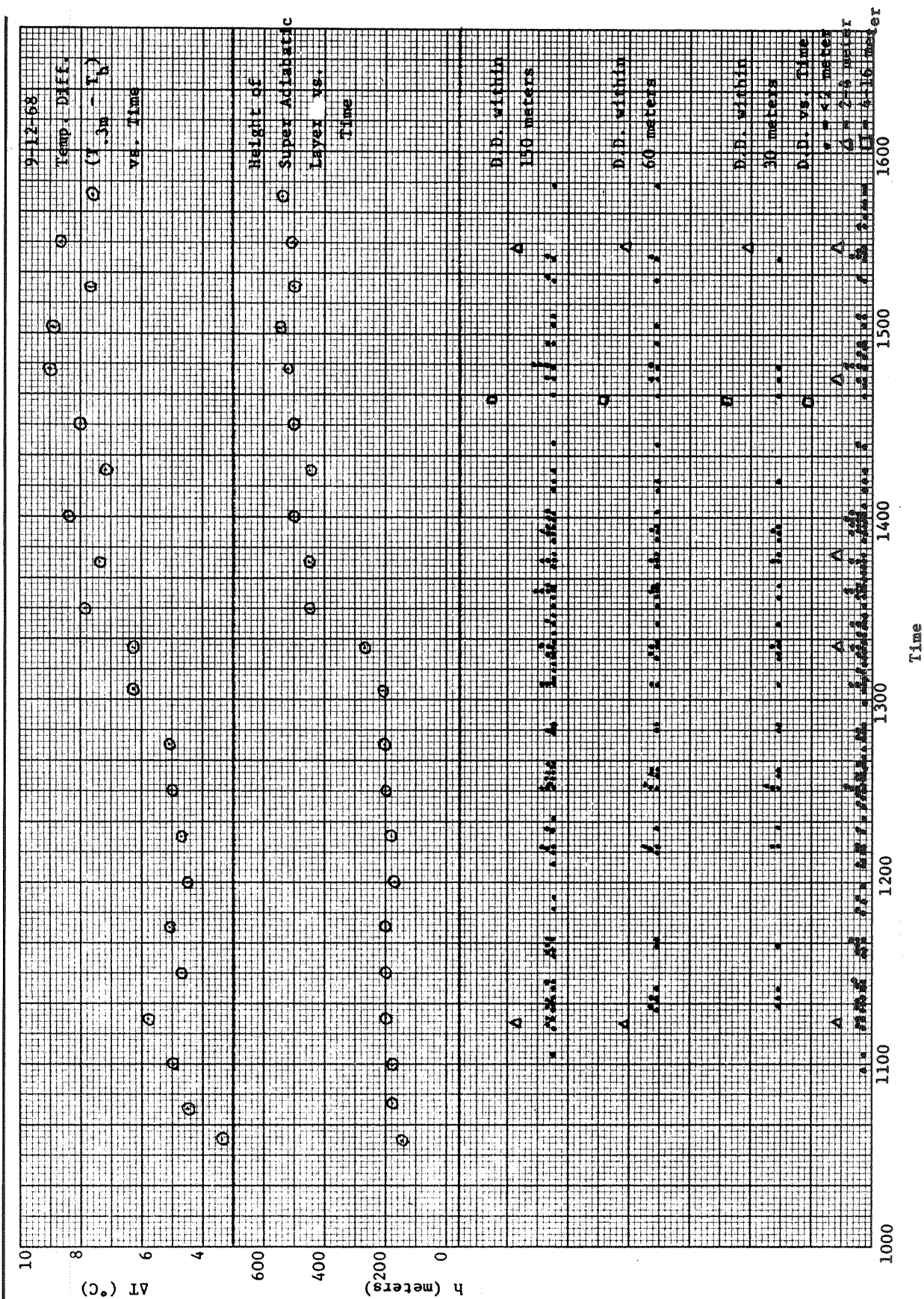
9-12-68

1530 PDT

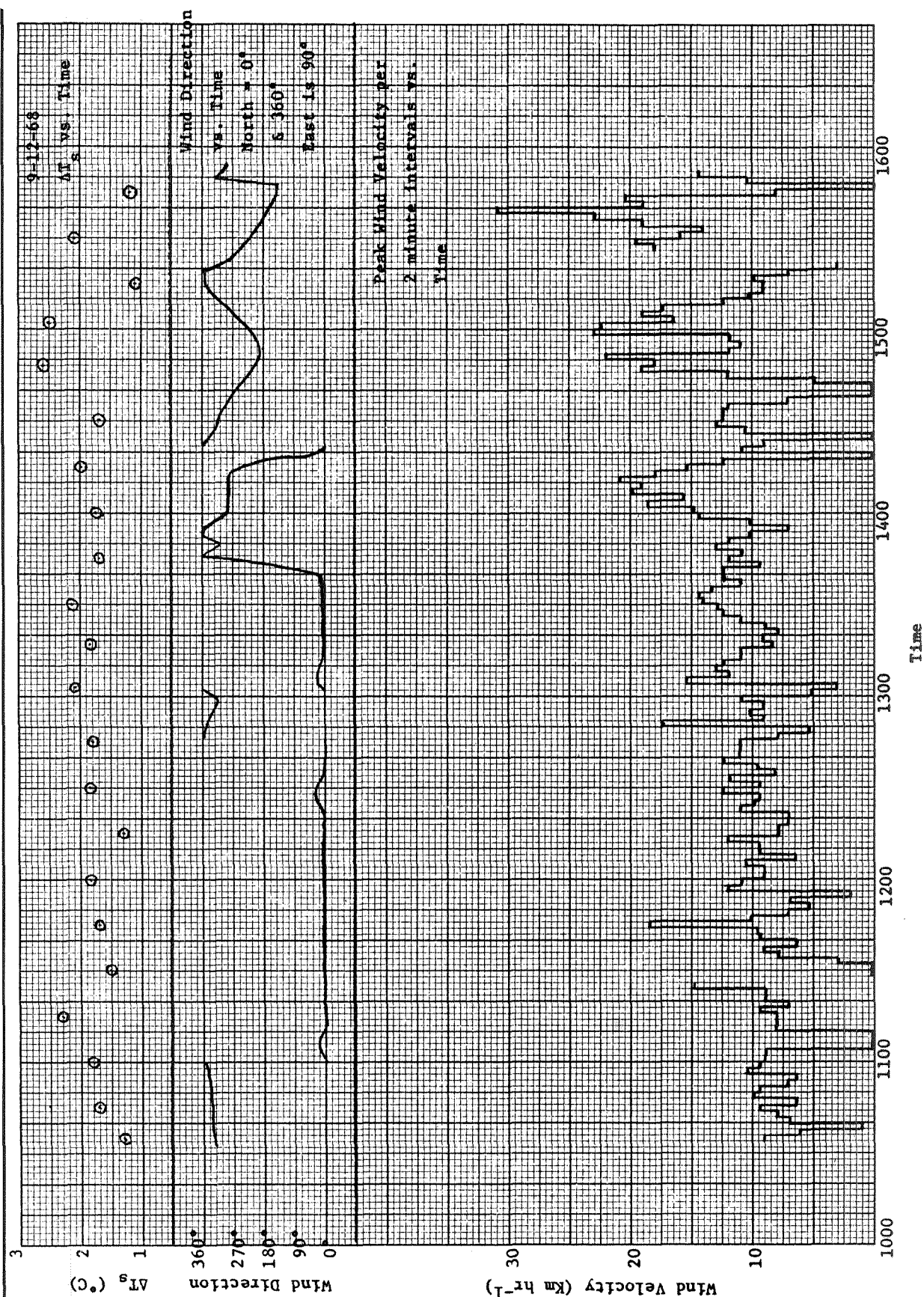


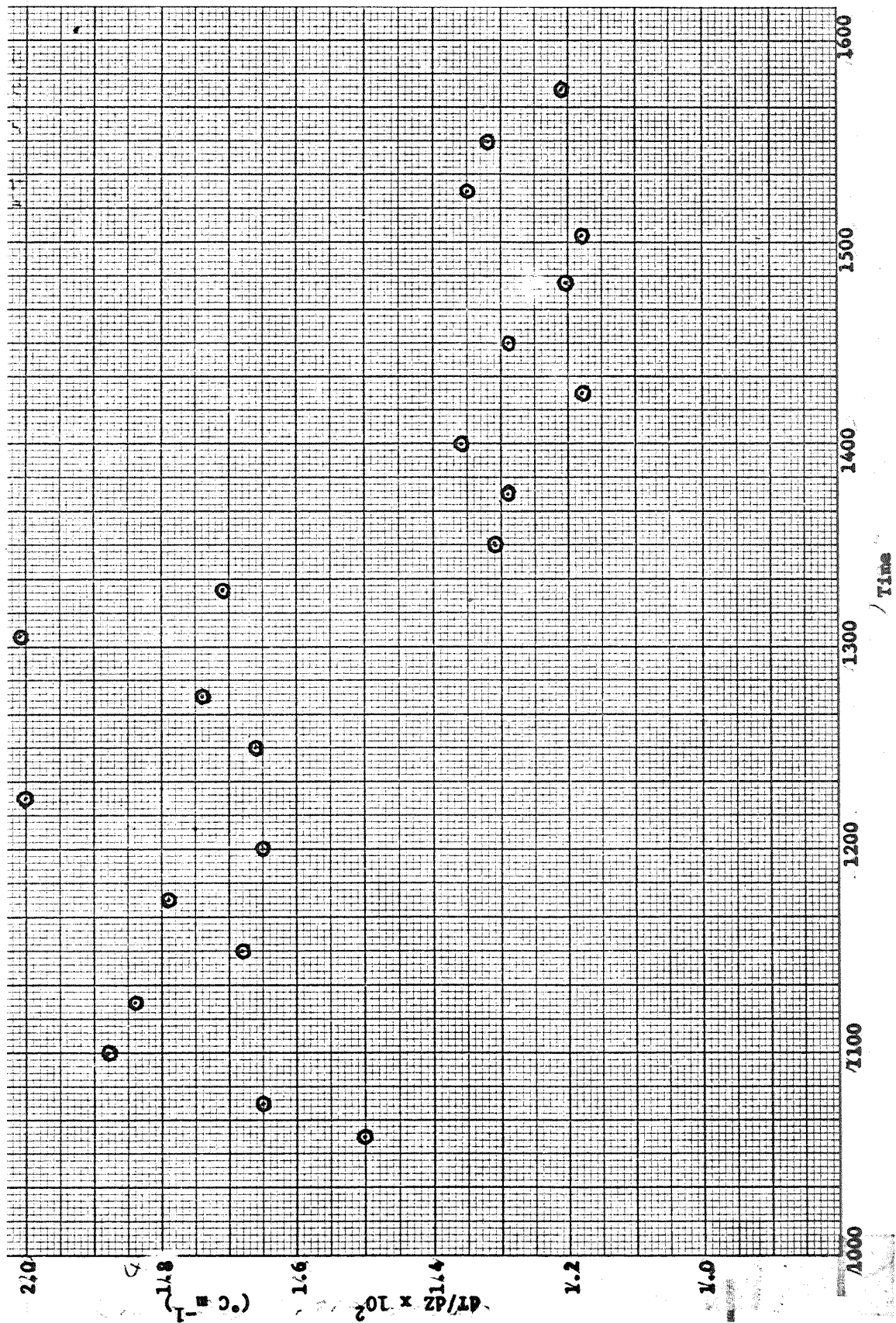
9-12-68

1545 PDT



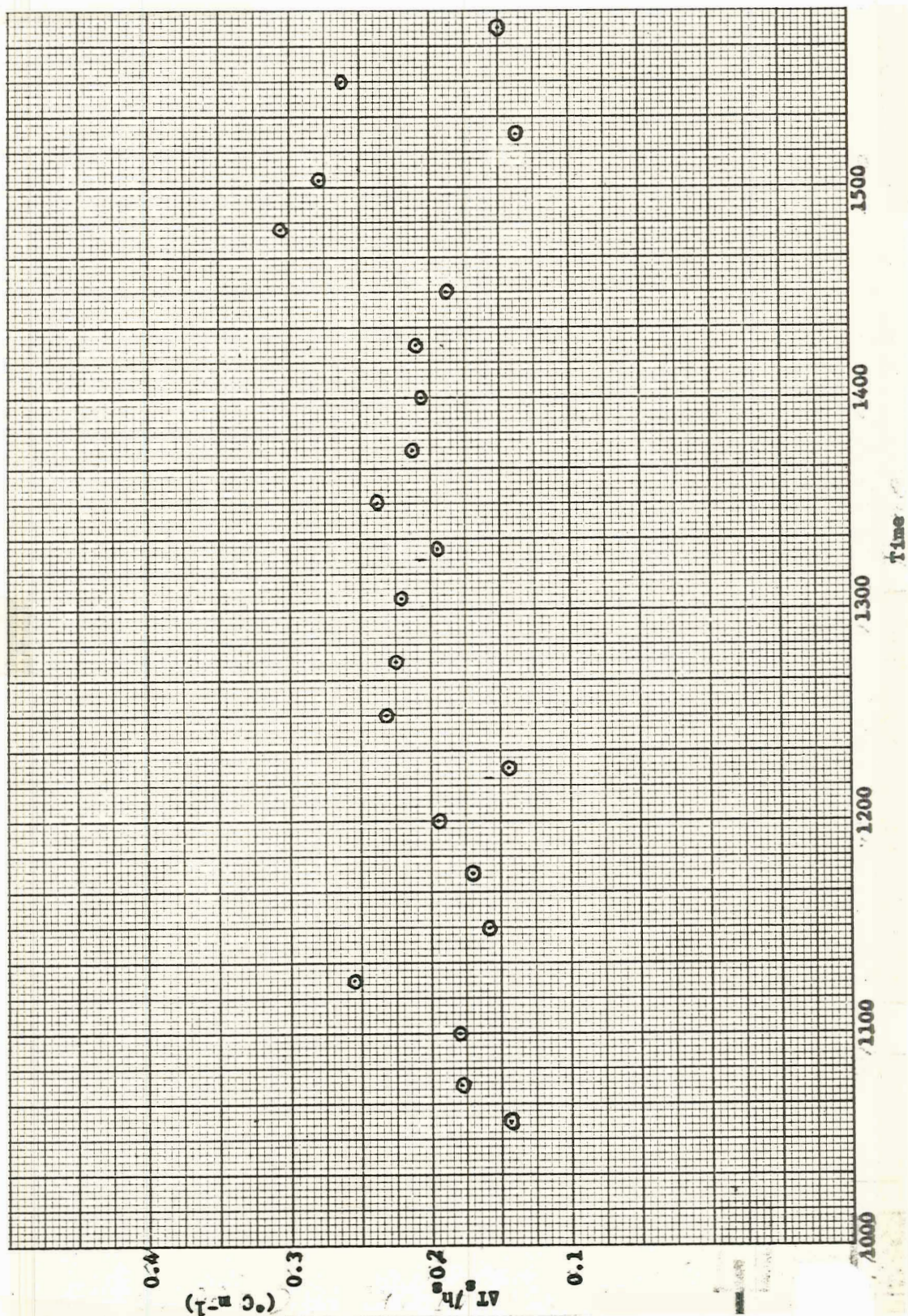
30-692-9 (8-68)





9-12-68

Lapse Rate (dT/dZ) vs. Time



9-12-68

$\Delta T_s/h_s$ vs. Time